VIRGINIA MEDICAL MONTHLY

OFFICIAL PUBLICATION OF THE MEDICAL SOCIETY OF VIRGINIA

Vol. 66, No. 6.
WHOLE No. 1044.

RICHMOND, VA., JUNE, 1939

$2.00 A YEAR
25 CENTS A COPY

CONTENTS

The Present Status of the Medical Treatment of Peptic Ulcer. T. Dewey Davis, M. D., Richmond, Va. 317

Clinical Manifestations of Acute Rheumatic Fever: Age Incidence, Diagnosis and Treatment. J. Franklin Waddill, M. D., Norfolk, Va. 322

Alcohol or Candy. Beverley R. Tucker, M. D., Richmond, Va. 329

Bronchiectasis: A Consideration of Its Causes and Its Prevention. Louis H. Clerf, M. D., Philadelphia, Penna. 332

Nutritional Deficiency Disease—With Special Reference to Vitamin B Deficiency. Oscar L. Hite, M. D., Richmond, Va. 335

Mortality from Malaria in the United States. John Benjamin Nichols, M. D., Washington, D. C. 339

Lymphedema of Extremities. Eugene L. Lowenberg, M. D., F. A. C. S., Norfolk, Va. 345

Imperforate Hymen—Report of a Case. J. Kotz, M. D., F. A. C. S., and Morton S. Kaufman, B. A., M. D., Washington, D. C. 355

The Healing Process—General Principles. M. H. Todd, M. D., Norfolk, Va. 357

CORRESPONDENCE 361

PUBLIC HEALTH STATISTICS 361

WOMAN'S AUXILIARY TO THE MEDICAL SOCIETY OF VIRGINIA 363

TRUTH ABOUT MEDICINE 364

BOOK ANNOUNCEMENTS 365

EDITORIAL 366

DEPARTMENT OF CLINICAL AND MEDICAL EDUCATION OF THE MEDICAL SOCIETY OF VIRGINIA 370

PROCEEDINGS OF SOCIETIES 372

NEWS NOTES 373

OBITUARY RECORD 379

INDEX TO ADVERTISERS—Advertising Page 6

Entered as Second Class Matter at the Postoffice, Richmond, Va.

BACKGROUND

Three Decades of Clinical Experience

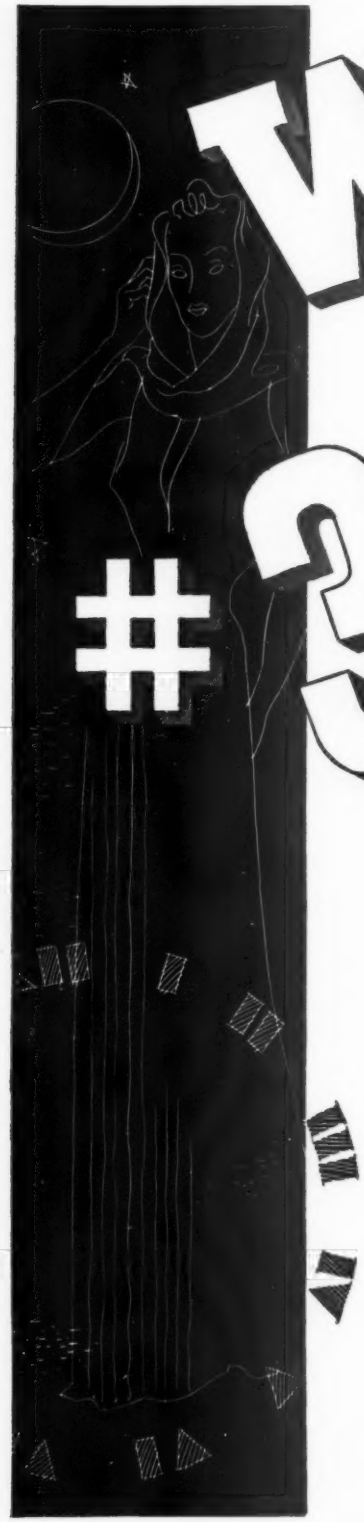
THE use of cow's milk, water and carbohydrate mixtures represents the one system of infant feeding that consistently, for three decades, has received universal pediatric recognition. No carbohydrate employed in this system of infant feeding enjoys so rich and enduring a background of authoritative clinical experience as Dextri-Maltose.

DEXTRI-MALTOSE No. 1 (with 2% sodium chloride), for normal babies.
DEXTRI-MALTOSE No. 2 (plain, salt free), permits salt modifications by the physician.
DEXTRI-MALTOSE No. 3 (with 3% potassium bicarbonate), for constipated babies.

These products are hypo-allergenic.

DEXTRI-MALTOSE

Please enclose professional card when requesting samples of Mead Johnson products to cooperate in preventing their reaching unauthorized persons. Mead Johnson & Company, Evansville, Ind., U. S. A.



WHY

THE EMULSION...

Petrolagar

FOR CONSTIPATION

#3

Does not coat intestinal mucosa. Petrolagar is an aqueous suspension of mineral oil—oil in water emulsion.

1. Petrolagar is more palatable. Easier to take by patients with aversion to plain oil—may be thinned by dilution.
2. Miscible in aqueous solutions. Mixes with gastro-intestinal contents to form a homogeneous mass.
4. No accumulation of oil in folds of mucosa.
5. Will not coat the feces with oily film.
6. Does not interfere with secretion or absorption.
7. Augments intestinal contents by supplying an unabsorbable fluid.
8. More even distribution and dissemination of oil with gastro-intestinal contents.
9. Assures a more normal fecal consistency.
10. Less likely to leak.
11. Provides comfortable bowel action.
12. Makes possible five types of Petrolagar to select from to meet the special needs of Bowel Management.

Petrolagar — Liquid petrolatum 65 cc. emulsified with 0.4 Gm. agar in a menstruum to make 100 cc.

Petrolagar

Petrolagar Laboratories, Inc. • 8134 McCormick Boulevard • Chicago, Illinois

SCENES FROM THE LABORATORIES OF UPJOHN

Bacteriology

"Harvesting" pathogenic bacteria

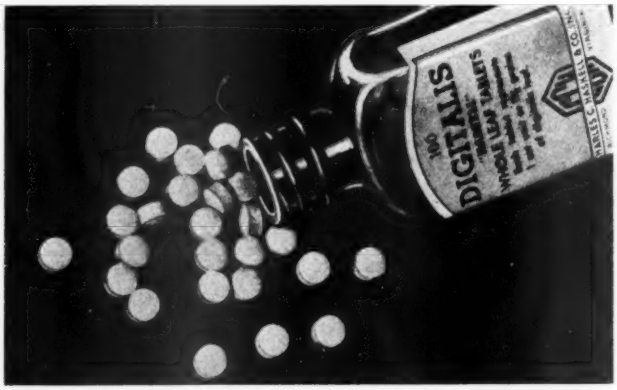
RESEARCH IN BACTERIOLOGY is of fundamental importance in the development and commercial production of antigens and parenteral solutions. Constantly controlled technique is essential to safeguard the finished product for the medical profession.

THE UPJOHN COMPANY

KALAMAZOO, MICHIGAN

Makers of Fine Pharmaceuticals Since 1886

In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.



DIGITALIS "Haskell"

Accurately Standardized
Clinically Tested
Council-Accepted

•

Tablets of 1 Cat Unit in bottles of
30 and 100.

Literature and samples gladly sent
on request.

•

CHARLES C. HASKELL & CO., Inc.
RICHMOND, VIRGINIA

GILLILAND

TETANUS TOXOID
ALUM PRECIPITATED

For active immunization against tetanus.

Tetanus Toxoid, Alum Precipitated, is recommended for the immunization of persons whose occupation repeatedly exposes them to infection with C. tetani. Included in such occupations are all of the heavy industries, farming, military service, etc.

Two doses of Tetanus Toxoid should be given with an interval of two months between doses. The active immunity produced may last for years; however, it is recommended that patients actively immunized against tetanus should receive an additional dose of Tetanus Toxoid if injury occurs.

DIPHTHERIA TOXOID
ALUM PRECIPITATED

For active immunization against diphtheria.

This product has been used for years with excellent results. A single dose confers immunity within a few weeks. It is especially recommended for the immunization of children between the ages of six months and six years, the most desirable period for immunization.

Literature and prices sent upon request.

THE GILLILAND LABORATORIES

MARIETTA, PA.

In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.

SURGICAL INSTRUMENTS—
EQUIPMENT AND LABORATORY
APPARATUS

W. O. HESTER

SHOW ROOM—308 North 12th Street.
RESIDENCE—3122 West Grace Street—Phone 4-6612.
Richmond, Virginia.

VIRGINIA ENGRAVING CO
Photo Engravers
101 Governor St.
Richmond, Va.
PLATES FOR LINE AND HALFTONE PRINTING
DRAWINGS - - RETOUCHING

GARST BROS. DAIRY INC.

GRADE A PASTEURIZED VITEX VITAMIN D MILK
With 400 U. S. P. Units From Codliver Oil Added Per Qt. By Vitex Process
ROANOKE'S MOST MODERN DAIRY
DIAL 5501

INDEX TO ADVERTISERS

Coca-Cola	22
Cook County Graduate School of Medicine	8
Eli Lilly and Company	14
Fairchild Bros. & Foster	9
Garst Bros. Dairy, Inc.	6
Gilliland Laboratories, The	5
Gill Memoral Eye, Ear and Throat Hospital, Inc.	19
Haskell & Co., Inc., Charles C.	4
Hester, W. O.	6
Hotel John Marshall—Hotel Richmond—Hotel Wm. Byrd	7
Jefferson Hospital and Training School for Nurses	16
Jefferson Medical College of Philadelphia, The	11
Johnston-Willis Hospital	17
Knox Gelatine Laboratories	13
Lederle Laboratories, Inc.	10
Luzier's Inc., Makers of Fine Cosmetics	25
McGuire Clinic	15
Mead Johnson & Company	1
Mead Johnson & Co.	28
Medical College of Virginia	17
Medical Examining Board of Virginia, The	11
Medical Societies in Virginia, Component and Other	24
Medical Society of Virginia, The—Medicine In Virginia	22
Miller & Rhoads	26
Mount Regis Sanatorium	18
National Association of Chewing Gum Manufacturers, The	26
New York Polyclinic Medical School and Hospital, The	11
Nestlé's Milk Products, Inc.	17
Nightingale Nursing Home, The	19
Parke, Davis & Company	28
Peoples Service Drug Stores	8
Petrolagar Laboratories, Inc.	2
Philip Morris & Co., Ltd., Inc.	12
Physicians Casualty Ass'n.—Physicians Health Ass'n.	7
Powers & Anderson, Inc.	7
Saint Albans Sanatorium	20
St. Elizabeth's Hospital	18
S. M. A. Corporation	27
Stuart Circle Hospital	20
Thalhimers	8
Thompson Homestead School, The	19
Tidewater Rabbitry	11
Tucker Sanatorium, Incorporated, The	16
Upjohn Company, The	3
Valentine Company, Inc.	8
Veil Maternity Hospital, The	19
Virginia Engraving Co.	6
Westbrook Sanatorium	21
Williams Printing Company, The	9
Williams Printing Co.	22
Wyeth & Brother, Incorporated, John	15

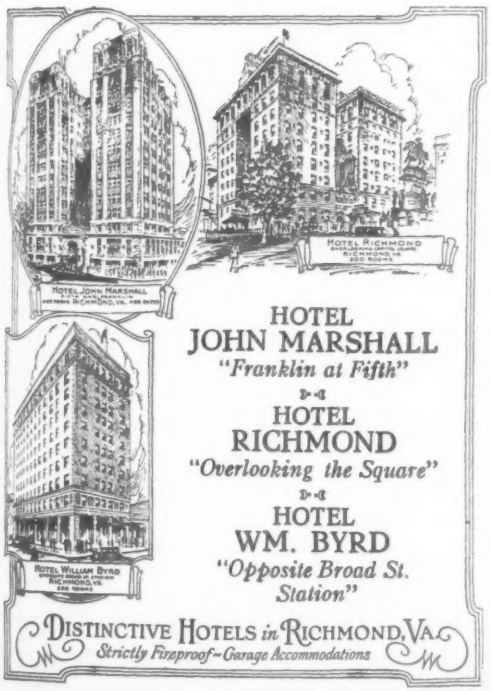
PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

ACCIDENT-SICKNESS
INSURANCE

For Ethical Practitioners Exclusively
(50,000 POLICIES IN FORCE)

$5,000.00 accidental death $25.00 weekly indemnity, accident and sickness	For $33.00 per year
$10,000.00 accidental death $50.00 weekly indemnity, accident and sickness	For $66.00 per year
$15,000.00 accidental death $75.00 weekly indemnity, accident and sickness	For $99.00 per year

37 years under the same management
$1,700,000 INVESTED ASSETS
$9,000,000 PAID FOR CLAIMS
$200,000 deposited with State of Nebraska for protection of our members.
Disability need not be incurred in line of duty—benefits from the beginning day of disability.
Send for applications, Doctor, to
400 First National Bank Building - Omaha, Nebraska



HOTEL
JOHN MARSHALL
"Franklin at Fifth"
HOTEL
RICHMOND
"Overlooking the Square"
HOTEL
WM. BYRD
"Opposite Broad St. Station"

DISTINCTIVE HOTELS in RICHMOND, VA.
Strictly Fireproof~Garage Accommodations

for increased
BARBITAL ACTION

Cheplin's

Soluble Phenobarbital
(Sodium Phenobarbital)
Sterile Powder
In Rubber-Stoppered Vials — For Injection

The uses of Phenobarbital are similar to the original barbiturate—as a hypnotic in conditions of nervous insomnia; as an anticonvulsant in epilepsy and pre-operatively in the use of local anesthetics; and as a sedative, purely, in a wide range of conditions. Its solubility makes it suitable for injection, subcutaneously and intramuscularly, or when indicated, intravenously.

Cheplin's Soluble Phenobarbital is supplied in vials only, to assure complete asepsis. Sterile water can be added through rubber stopper without exposing contents—not possible with flame-sealed ampules, which must first be decapped. The solution is then made by shaking—still without exposing contents to the air—and similarly the solution can be aseptically withdrawn for injection.

Supplied—in the special rubber-stoppered vial, 2 gr. (0.13 Gm.) and 5 gr. (0.3 Gm.), in boxes of 12, 25 or 100. *See your Cheplin Catalogue.*

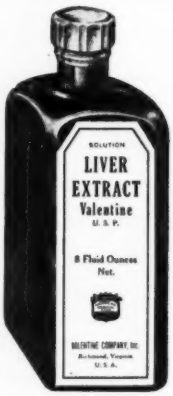
CHEPLIN BIOLOGICAL LAB., INC.
SYRACUSE, NEW YORK

known for
QUALITY
PURITY
INTEGRITY

In Ampule Medication
Distributed by
POWERS & ANDERSON, Inc.
Surgical Instruments, Hospital Supplies, Etc.
NORFOLK, VA. RICHMOND, VA.

An aqueous liver extract of proved potency and economy.
One U. S. P. oral unit in every one and one-half ounces.

SOLUTION LIVER EXTRACT VALENTINE U. S. P.



Concentrated—
for
oral administration

Contains Vitamin B
"complex"

ACCEPTED
AMERICAN
MEDICAL
ASSN

VALENTINE COMPANY, Inc.
RICHMOND, VIRGINIA

COOK COUNTY
GRADUATE SCHOOL OF MEDICINE
(IN AFFILIATION WITH COOK COUNTY HOSPITAL)
Incorporated not for profit

ANNOUNCES CONTINUOUS COURSES

MEDICINE—Two Weeks Course Gastroenterology June 19, September 25. Two Weeks Personal Course Electrocardiography August 7. Special Courses in August. Two Weeks Course October 9.

SURGERY—General Courses, One, Two, Three and Six Months; Two Weeks Intensive Course in Surgical Technique with practice on living tissue; Clinical Courses; Special Courses. Courses start every two weeks.

GYNECOLOGY—Two Weeks Personal Course June 19; Four Weeks Personal Course August 28. Two Weeks Course October 9.

OBSTETRICS—Two Weeks Intensive Course June 19, October 23. Informal Course every week.

FRACTURES & TRAUMATIC SURGERY—Ten-Day Formal Course June 19, September 25. Informal Course every week.

OTOLARYNGOLOGY—Two Weeks Intensive Course starting September 11. Informal Course every week.

OPHTHALMOLOGY—Two Weeks Intensive Course starting September 25. Informal Course every week.

CYSTOSCOPY—Ten-Day Practical Course rotary every two weeks. Urology Courses every two weeks.

ROENTGENOLOGY—Special Courses X-Ray Interpretation, Fluoroscopy, Deep X-Ray Therapy starting every week.

TEACHING FACULTY — ATTENDING STAFF OF COOK COUNTY HOSPITAL

Address:
Registrar, 427 South Honore Street,
CHICAGO, ILLINOIS

CAMP SUPPORTS

fitted according to
Doctors prescriptions

General Supports
Sacro Iliac
Ptosis
Maternity

Our fitter skillfully trained
in the CAMP school

Corset Dept.
Third Floor

THALHIMERS
Richmond Virginia

An Emblem of Service

PEOPLES SERVICE DRUG STORES

Every Prescription Double-Checked

Alexandria
Bristol
Clarendon
Danville
Fredericksburg
Harrisonburg
Martinsville
Newport News
Norfolk
Petersburg
Portsmouth
Richmond
Roanoke
Suffolk
Winchester

Gastric Tissue Juice Extract

ENZYMOL

PROVES OF SPECIAL SERVICE IN THE TREATMENT OF PUS CASES

ENZYMOL resolves necrotic tissue, exerts a reparative action, dissipates foul odors; a physiological, enzymic surface action. It does not invade healthy tissue; does not damage the skin.

It is made ready for use, simply by the addition of water.

These are simply notes of clinical application during many years:

ABSCESS CAVITIES
ANTRUM OPERATION
SINUS CASES
CORNEAL ULCER
CARBUNCLE
RECTAL FISTULA
DIABETIC GANGRENE
AFTER REMOVAL OF TONSILS
AFTER TOOTH EXTRACTION
CLEANSING MASTOID
MIDDLE EAR
CERVICITIS

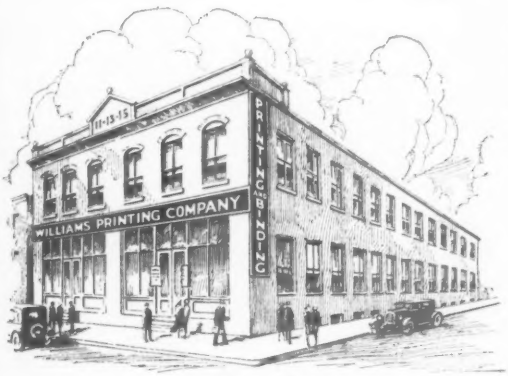
Originated and Made by

Fairchild Bros. & Foster

New York

You will benefit—

by placing your printing orders with a
LARGE, WELL-EQUIPPED PLANT . . . .



Established 1880

You will benefit, not only through receiving high quality work produced by skilled workmen, but from the saving in cost resulting from efficient planning and cut-cost methods. It will pay you in more ways than one, to get in touch with us if you use—

Commercial, Book and Job Work
Catalogues—Publications
Advertising Literature
Booklets—Broadsides
Office and Factory Forms
Loose-Leaf and Manifold Forms
Ledger Leaves and Loose-Leaf Binders
Paper Ruling
Complete Binding Equipment

THE WILLIAMS PRINTING COMPANY

11-13-15 North Fourteenth Street RICHMOND, VIRGINIA

Summer vacation plans should include
consideration of preliminary prophylaxis
against the misery and inconvenience of

IVY POISONING

TWO SMALL INJECTIONS (1 cc. each) of "Poison Ivy Extract *Lederle*" administered within a two-week interval have shown, in controlled clinical studies and experiences, that ivy dermatitis can be prevented in a large proportion of susceptible persons.

It must be emphasized, however, that the protection afforded by these prophylactic injections is effective only against ordinary, casual contacts, and is not effective against vigorous *handling* of the plant. The protection should suffice to immunize the individual for the entire season.

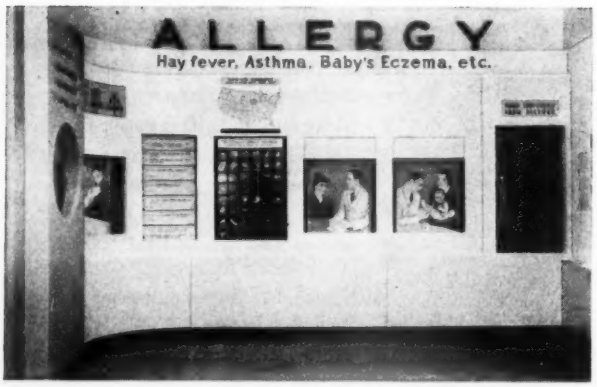
In the *treatment* of ivy poisoning, one or two injections of "Poison Ivy Extract *Lederle*" often give marked relief within a short time.

PACKAGES:

2 syringes (1 cc. each)
1 syringe (1 cc.)

LEDERLE LABORATORIES, INC.
30 ROCKEFELLER PLAZA NEW YORK, N.Y.

Lederle's exhibit on "Allergy" at the New York World's Fair (Medicine and Public Health Building) presents in silent pictured narrative an ingenious popular review of the subject.



The Medical Examining Board of Virginia

WILL HOLD ITS NEXT MEETING IN RICHMOND, JUNE 21-23, 1939. All applications should be complete in the hands of the Secretary at least ten days in advance. For further information, write Dr. J. W. Preston, Secretary-Treasurer, Roanoke, Va., or Dr. P. W. Boyd, President, Winchester, Va.

LABORATORY STOCK

Virgin does for Friedman's tests $1.50 each.
Also matured stock either sex for other uses $.35 per pound.

Shipped F.O.B. Rabbitry.

Contracts Solicited.

All stock guaranteed as represented.

TIDEWATER RABBITRY

235 Hugo Ave., Norfolk, Va. — 1904 Glasgow St., Portsmouth, Va.

Norfolk 34924 Phones Portsmouth 3672J

THE NEW YORK POLYCLINIC
MEDICAL SCHOOL AND HOSPITAL

(Organized 1881)

(The Pioneer Post-Graduate Medical Institution of America)

OBSTETRICS AND GYNECOLOGY

A FULL TIME COURSE. IN OBSTETRICS: LECTURES; PRENATAL CLINICS; WITNESSING NORMAL AND OPERATIVE DELIVERIES; OPERATIVE OBSTETRICS (MANIKIN). IN GYNECOLOGY: LECTURES; TOUCH CLINICS; WITNESSING OPERATIONS; EXAMINATION OF PATIENTS PRE-OPERATIVELY; FOLLOW-UP IN WARDS POST-OPERATIVELY. OBSTETRICAL AND GYNECOLOGICAL PATHOLOGY. REGIONAL ANESTHESIA (CADAVER). ATTENDANCE AT CONFERENCES IN OBSTETRICS AND GYNECOLOGY—OPERATIVE GYNECOLOGY (CADAVER).

UROLOGY

A combined full-time course in Urology, covering an academic year (8 months), will be inaugurated on October 1, 1939. It will comprise instruction in pharmacology; physiology; embryology; biochemistry; bacteriology and pathology; practical work in surgical anatomy and urological operative procedures on the cadaver; regional and general anesthesia (cadaver); office gynecology; proctological diagnosis; the use of the ophthalmoscope; physical diagnosis; roentgenological interpretation; electrocardiographic interpretation; dermatology and syphilology; neurology; physical therapy; continuous instruction in cysto-endoscopic diagnosis and operative instrumental manipulation; operative surgical clinics; demonstrations in the operative instrumental management of bladder tumors and other vesical lesions as well as endoscopic prostatic resection.

For Information Address

MEDICAL EXECUTIVE OFFICER, 345 West 50th Street, New York City

THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA

THE ONE HUNDRED AND FIFTEENTH ANNUAL SESSION BEGINS SEPTEMBER 20, 1939, AND ENDS JUNE 7, 1940.

FOUNDED 1825. A chartered university since 1838. Graduates 16,447.

FACILITIES: Modern, well-equipped laboratories; Curtis Clinic; Daniel Baugh Institute of Anatomy; Department for Diseases of the Chest; Jefferson Hospital; teaching museums and free libraries; instruction privileges in three other hospitals.

ADMISSION: A college degree based on four years of college work including certain specified science and language courses is required.

For full information, address The Dean, The Jefferson Medical College, Philadelphia, Pa.

52 WEEKS A YEAR—
RESEARCH IN PROGRESS

Under the sponsorship of Philip Morris, research is constantly being conducted on the subject of smoking.

Grants have been provided at scientific institutions of unquestioned repute—always with the stipulation that findings may be published in full. For Philip Morris is not trying to *prove* anything—but rather to uncover facts ...facts of interest to the profession—to the public—and to Philip Morris.

A number of such unbiased reports have already been published, on the varying effects of hygroscopic agents used in cigarettes. The facts revealed are of definite value in advising patients on smoking.

If you have not yet sent for reprints, won't you use the coupon below?

PHILIP MORRIS & CO. LTD., INC.

PHILIP MORRIS & CO. LTD., INC. 119 FIFTH AVENUE, NEW YORK

*Please send me copies of the reprints checked.

Proc. Soc. Exp. Biol. and Med., 1934, 32, 241-245 ☐	N. Y. State Jour. Med. 1935, 35-No. 11,590 ☐
Laryngoscope, 1935, XLV, 149-154 ☐	Laryngoscope, 1937, XLVII, 58-60 ☐

NAME_____

ADDRESS_____

CITY_____ STATE_____

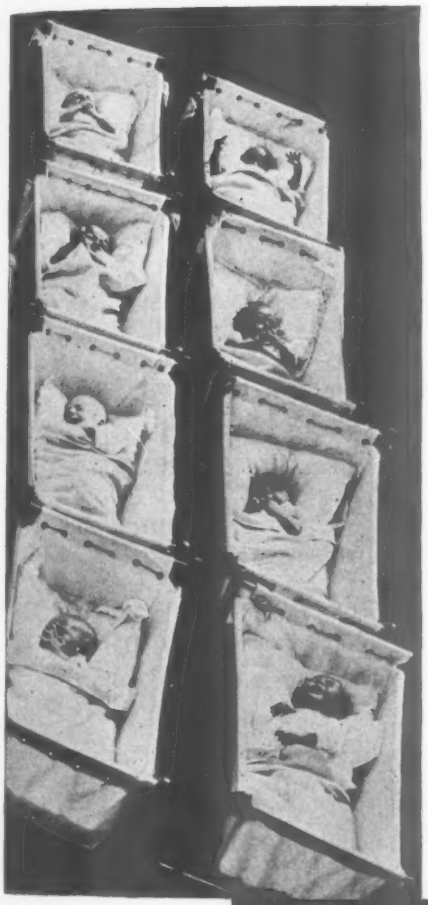
VIR

Tune in to **"JOHNNY PRESENTS"** *on the air Coast-to-Coast Tuesday evenings, NBC Network... Saturday evenings, CBS Network... Friday evenings... Mutual Network*

In writing advertisers' please mention VIRGINIA MEDICAL MONTHLY.

Accidental Discovery

Gelatinized Milk DECREASES INCIDENCE OF UPPER RESPIRATORY INFECTIONS IN INFANTS



Many a useful discovery has resulted from a chance finding by a keen observer.

Two years ago a group of university workers fed milk containing 1 and 2% plain, unflavored gelatine to a group of infants. There was a lower incidence of vomiting, diarrhea, and constipation than in control groups. As a corollary, they noticed that those receiving the gelatine formula suffered fewer upper respiratory infections. This was interesting enough to demand further study. The work* was recently repeated in two different clinics and the results substantiated. Knox Gelatine (U.S.P.) was used. It is 100% pure U.S.P. Gelatine—85% protein—in an easily digestible form—contains no sugar and should not be confused with factory-flavored, sugar-laden dessert powders.

* Further Clinical Observations on Feeding Infants Whole Milk, Gelatinized Milk, and Acidified Milk. C. Loring Joslin, M.D., F.A.A.P.; Bulletin of the School of Medicine, University of Maryland; Jan. 1939.

Write Dept. 441

KNOX GELATINE LABORATORIES

JOHNSTOWN NEW YORK

Please send reprint of Joslin study.

_____ *M.D.*

Street _____

City _____ *State* _____

In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.

CRITERIA—Standards of Judging

Criteria for judging medicinal products should include the identifying mark of the manufacturer. Pharmaceuticals and biologicals bearing the Red Lilly invite confidence when judged by criteria of potency, uniformity, stability, and purity.

For Parenteral Treatment of Pernicious Anemia

AMPOULES SOLUTION LIVER EXTRACT PURIFIED—contain 15 U.S.P. units per cc. Supplied in packages of three 1-cc. rubber-stoppered ampoules and in packages of one 10-cc. ampoule.

AMPOULES SOLUTION LIVER EXTRACT CONCENTRATED, LILLY—contain 2 U.S.P. units per cc. Supplied in 10-cc. rubber-stoppered ampoules and in packages of four 3.5-cc. rubber-stoppered ampoules.

AMPOULES SOLUTION LIVER EXTRACT, LILLY—contain 1 U.S.P. unit per cc. Supplied in 10-cc. rubber-stoppered ampoules.

ELI LILLY AND COMPANY

INDIANAPOLIS, INDIANA, U. S. A.

In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.

Virginia Medical Monthly

Official Publication of the Medical Society of Virginia

Vol. 66, No. 6.
WHOLE No. 1044.

RICHMOND, VA., JUNE, 1939

$2.00 A YEAR
25 CENTS A COPY

THE PRESENT STATUS OF THE MEDICAL TREATMENT OF PEPTIC ULCER.*

T. Dewey Davis, M.D.,
Richmond, Virginia.

My object in discussing the medical therapy of peptic ulcer with you today is to emphasize certain concepts of the present day treatment of this disease. It is not my purpose to dwell on the etiology to much extent, since in spite of extensive experimental and clinical investigations extending over many years, we still must approach this phase with theories and not facts. It is recognized, however, that the disease occurs most often, and in more pernicious form, in individuals of peculiar physical and nervous make-up. They are usually lean and lanky, with fears and inhibitions; they commonly are specialists in life, and have the "go-getter" temperament. We who deal extensively with patients whose chief complaint is indigestion learn to spot the type at first glance, but why do so many of them exhibit the make-up and the symptomatology of peptic ulcer but without X-ray or exploratory evidence of a local ulcerative lesion? We then are ignorant as to what sets up the ulceration, why it may heal spontaneously, and why after weeks, months or years it may recur exactly as before.

From accumulated clinical experience, it has been shown that if the gastric acidity is adequately controlled by any means, relief of symptoms and healing of the ulcer will occur. Experimentally, evidence has been produced that instilling hydrochloric acid of approximately the same concentration as is in the gastric juice directly on the ulcer through the duodenal tube has precipitated the characteristic ulcer pain. No one, however, has ever proved that gastric acidity is the actual cause of ulceration; in fact, the preponderance of evidence is against this view.

We, therefore, are forced to treat peptic ulcer empirically. The fundamental principles laid down by Sippy twenty-five years ago still constitute the backbone of treatment. The many modifications of his plan are all designed to promote rest of the stomach and control of gastric acidity. This non-spectacular régime is the patient's job, and he naturally welcomes anything which will relieve him of the responsibility while shifting it to his physician. Anyone who has followed the subject over a period of twenty years can recall the many short cuts that have been proposed, tried and discarded. I will mention only three of these: Injection of foreign proteins, synodol, and histidine (larostidin). Two quotations from a recent article by Crohn would seem to cover this portion of the subject. He says, "I have failed to find anything of value in these agencies. Reports concerning them in the literature to date are extremely guarded when given by men who value their professional reputation, and enthusiastic when coming from overzealous practitioners who evidence but little judgment." Later he continued, "The expense involved, the daily visits, the local and general reactions and the high percentage of recurrences after six months of this treatment fail to establish a case for histidin as against the more orthodox conservative dietary routine. Treatment by injection smacks more of the Continental fondness for proprietary drugs and probably redounds more to the benefit of the commercial houses that promote them than to the welfare of the patient."

My own experience with the injection treatment of peptic ulcer has been limited to those patients who were anxious to try it and I am convinced that the good effect is psychic and could just as well be obtained by a syringe loaded with distilled water, provided the patient were not aware of the content.

Theoretically, powdered gastric mucin should be an ideal agent to control gastric acidity since it does not introduce a foreign substance into the body. It controls gastric acidity when given in appropriate

*Read before the sixty-ninth annual session of the Medical Society of Virginia, at Danville, Va., October 4-6, 1938.

amounts and at proper intervals and it does have a demulcent effect. The objectionable taste, the cost and the fact that it carries the same monotony as the Sippy régime have prevented its general acceptance.

The physician who simply makes a diagnosis of peptic ulcer on his patient, hands him a diet list and prescriptions for certain medications will not get far toward curing his patient. It has often been said that the more a diabetic knows about diabetes the longer will be his life expectancy. To further this idea, many large clinics have courses of instruction for unfortunate victims of this disease. The same holds true for peptic ulcer. The more the patient knows about the ulcer, the better his chance for a cure and the prevention of recurrence. It is, therefore, the unquestioned duty of the physician to take time for a thorough explanation of the disease and the principles underlying the therapy outlined. Furthermore, it is essential that the patient report at rather frequent intervals for additional conferences. These serve to check the quite known tendency to become lax in the program when the apparent need of it has long since disappeared. It is my custom to set a period of two years as the required time for healing of the ulcer. I expect healing to occur much sooner than this, but in this time the habit of frequent feeding becomes more fixed and is easily continued indefinitely in the hope of preventing recurrences.

The dietary program is important but also it is necessary to change the individual's general habits. He must slow down nervously, getting more rest and relaxation; he must avoid excess of stimulants, and, from clinical and experimental observations, there seems little question that tobacco should be prohibited. I seriously doubt that merely reducing the amount of tobacco smoking is of much value. My reason for this statement is that patients often tell me that they "feel" an occasional cigarette much more than when they keep their bodies saturated with nicotine.

It is not my purpose to give you the details of medical treatment—you are already familiar with these. I would emphasize that the nearer the diet prescribed approaches the general the better chance there is of the patient following it. The prohibition of certain acid and stimulating foods and roughage is certainly indicated, but to insist that all vegetables be pureed invites breaking of the diet. I have noted in recent years a definite tendency on the part of some teachers to omit all medication from the program. However, I think it wise to give patients some medicine. They expect it, and probably some combination of belladonna with a mild sedative three or four times a day is of benefit. Alkalies have long been standards in the program. I definitely believe that the inclusion of absorbable alkalies, such as sodium bicarbonate, is not a good practice, but long experience with mixtures of magnesium oxide and bismuth subcarbonate convinces me that these are harmless and this mixture when properly proportioned is quite effective in over-coming constipation, which is such a common symptom in the peptic ulcer syndrome.

There has been a strong tendency in recent years to use compounds, such as magnesium trisilicate and colloidal aluminum hydroxide (cremalin) as acid neutralizers. Either of these in my experience has been very satisfactory except that they are mildly astringent and tend to produce additional constipation. This may be combated by a bedtime dose of mineral oil or magnesia.

In intractable cases, the continuous milk-drip method of Winkelstein, or the drip administration of colloidal aluminum hydroxide, as advocated by Woldman and his co-workers, would seem to be most logical. Personally, I find that the patient with this type of ulcer is usually not temperamentally suited to the retention of the tube in his nose or mouth for a sufficient period of time for the therapy to be effective.

The question of a preliminary period of bed rest is one that requires careful consideration. Theoretically, two to six weeks of complete rest should be invaluable. Economically, this is rarely practicable except with actual or threatened complications. To put a bread winner to bed in the face of mounting bills during his enforced inactivity will usually produce more nervous tension than previously existed. It is my practice, therefore, to start the great majority of my cases on ambulatory treatment.

Considerable discussion has appeared in the literature recently on the handling of ulcer patients with massive hemorrhage. This complication will arise eventually in about 20 per cent of the cases. We need not fear a fatal termination from hemorrhage in more than 1 per cent of these, and, if statistics were closely analyzed, the great majority of fatalities

would occur in elderly patients with sclerotic vessels. The two patients in my experience who have bled to death have been in this category, and when my third case makes its appearance I plan to advise immediate surgical intervention. It has been my policy not to transfuse these patients unless their hemoglobin drops below 40 per cent or the systolic blood pressure persistently remains below 90 mm.

Immediately following a gross gastric hemorrhage, I believe the patient should be quieted with opiates, his stomach should be kept empty and necessary fluids given rectally or parenterally. The period of starvation will be continued for two or three days, depending on the indications of arrest of the hemorrhage. Then Sippy treatment is instituted. I am aware of the fact that Muhlengracht and a few others advocate immediate institution of Sippy treatment in these cases. I can see argument in favor of their plan but am not ready as yet to make the change. An important point to remember is that iron is not as effective when administered along with alkalies. It is better to use one of the newer acid absorbers mentioned above in this situation.

In conclusion, I would like to state that nothing in the practice of medicine gives me more comfort than to see the pinched, pain racked face of a suffering ulcer patient smooth out under so simple a régime. It must be recognized that there are many individuals who are temperamentally incapable of following routine treatment for an indefinite period. These people so often wind up in the surgeon's hands but, unfortunately, they may later bound back with recurrent ulcerations which are infinitely harder to manage than the original situation. With frankness, tact and firmness, we should show these people what they must do, that they are prone to recurrences and that their problem is apt to be lifelong, but that with perseverance and forbearance they may live comfortable and useful lives.

Professional Building.

DISCUSSION

DR. WALTER ADAMS, Norfolk: Dr. Davis has covered this subject very completely. As a matter of fact, it has so many ramifications that it can be compared to the subject of appendicitis, which the surgeons are always discussing. It has been cussed and discussed and recussed, and I think it is very timely indeed.

I want to comment upon one or two details that Dr. Davis outlined. In the first place, I wish to emphasize the prophylactic treatment of ulcer in certain anatomical types. Dr. Davis mentioned people of certain anatomical types who have a tendency to ulcer. There are various stages in the erosion stage, up to actual ulcer. When the actual ulcer occurs, and then the reversion to an erosion, and then a healing process takes place, we still have to take care of that patient. That goes back to the question of education, of which Dr. Davis has spoken.

The actual treatment of ulcer, of course, is divided into local and constitutional. It is not necessary to reiterate the importance of local care. Dr. Davis has mentioned drugs of an antispasmodic nature and has mentioned the alkaline compounds. He did not lay a great deal of stress upon between-meal feedings. In this connection I recall the remarks of Dr. Mallory last night, who said that in these conditions it is necessary to tell the patient to eat something between meals that must be chewed, not something of a liquid nature that will pass right through the stomach.

In dealing with the etiology one factor recurs to my mind. That is the neurogenic factor. That is connected with the imbalance of the autonomic nervous system, the parasympathetic as distinguished from the sympathetic; and it is in these tall, lean, vagotonic individuals that this imbalance is present. What does atropin do? It relieves the over-stimulation of the parasympathetic system.

Dr. Davis mentioned nicotine. Now, tobacco gives many of us an enormous amount of pleasure, and there are probably gentlemen right here in the room who have ulcer and are not going to stop smoking. We know, however, that nicotine is actually a drug, that it has active properties, and that it does stimulate the parasympathetic system. A patient with a background of ulcer who continues to smoke lays himself open to a lot of trouble unless he has experimented and knows the amount he can take. I therefore believe that in the beginning of the treatment of these cases the full curtailment of smoking is very important, not the cutting down to four or five cigarettes a day, because we do not know the tolerance of any person for nicotine, and the total withdrawal of the drug nicotine is very important.

The treatment of ulcer is not a spectacular thing. Patients like to be cured in a spectacular way. They like surgery more than medicine; they like to be sliced open and come back and talk about the operation. But a patient after having an operation must continue to take care of himself for the rest of his life. I am not arguing against surgery, but I do feel that many of these patients, if they are educated, can be trained to take care of themselves without surgery. The percentage that go to surgery is, of course, enormous.

DR. J. SHELTON HORSLEY, Richmond: Dr. Davis has admirably presented the general principles of the treatment of peptic ulcer. We must, first of all, consider that the primary cause of peptic ulcer is in many instances unknown, and that the treatment, whether medical or surgical, is largely empirical. The condition is much like hyperthyroidism. There undoubtedly is some stimulating cause in the nervous system, probably the central nervous system, that first leads to the hypersecretion. If we can

remove much of the thyroid that manufactures this secretion we produce a clinical cure. So in peptic ulcer, the cause may be a streptococcus, as Rosenow contends, but doubtless only in some of the cases. Infants are known to have peptic ulcers which perforate, and to have peptic ulcers when the milk came from cows with udders infected by streptococci. In most cases, however, peptic ulcer occurs in young or middle-aged adults who frequently are high-strung or over-wrought.

Cushing has given instances of peptic ulcer developing after operations on the brain in which the base of the brain was involved, and he favors the neurogenic theory of Rokitansky for the origin of peptic ulcer, or an imbalance between the sympathetic and the vagal influences, which usually means the predominance of the vagal impulses.

All peptic ulcers of the duodenum should be treated medically, at least at first. It is doubtful if the hypodermic injections of Larostidin or histamin products have any real value, just as Dr. Davis has said. Diet is the main factor in the treatment, together with occasionally such drugs as may reduce the acidity, preferably not giving sodium bicarbonate in large quantities continuously.

Surgery in peptic ulcer of the duodenum should be reserved for those cases in which there is marked or frequent bleeding (especially in those over forty), when there is perforation, when medical treatment fails to relieve symptoms, or when there is obstruction. Peptic ulcers of the stomach, however, which are far more infrequent than peptic ulcers of the duodenum, should be watched more carefully because there is undoubtedly a tendency of peptic ulcer of the stomach to turn into cancer in at least a small percentage of cases, or, what amounts to the same thing, an early cancer may stimulate a peptic ulcer both roentgenologically and clinically.

It must be recalled, too, that medical treatment in early cancer of the stomach will almost always relieve the symptoms at first; so this is no therapeutic diagnostic test as it is often considered. Peptic ulcer of the stomach that does not heal readily or is even suspicious of cancer should be operated upon early, whereas in the duodenum medical treatment can continue indefinitely unless complications arise. A peptic ulcer either of the first part of the duodenum or of the stomach that perforates into the pancreas usually requires operation for cure. Peptic ulcer of the pyloric sphincter is not often cured by medical treatment, but should be operated upon, preferably by partial gastrectomy.

If an operation is necessary for peptic ulcer, an endeavor should be made to restore the parts as nearly to physiologic normal as can be done. A gastro-enterostomy in a peptic ulcer in a young man with high acid content in the gastric juice is frequently followed by a jejunal ulcer and the last stage is often worse than the first. When the acid content of the stomach is low, gastro-enterostomy may be satisfactory. When surgery seems indicated, I am more and more inclined to do a partial gastrectomy, using a modification of the Billroth I type of gastrectomy and uniting the stomach to the duodenum. Pyloroplasty has some indications, though they are not frequent. When there is a stenosis with low acid and the patient is about middle age, a posterior gastro-enterostomy is usually satisfactory.

DR. WILLIAM B. PORTER, Richmond: Comments have been made about the action of nicotine on the nervous system with which I cannot agree. We have in the audience a man who really knows a good deal about this drug and its action on the nervous system, and I should like to have Dr. H. B. Haag straighten us out on the pharmacology of nicotine.

DR. HARVEY B. HAAG, Richmond: I was very much interested to hear Dr. Davis say what he did about some of the statements which patients with peptic ulcer have made as regards the effects of smoking two or three cigarettes and smoking a great many cigarettes. I think it is true that certain amounts of nicotine may stimulate the parasympathetic nervous system. As a result of that there might be an increase of spasm and hence an increase of pain in susceptible patients. With increased doses of nicotine one tends to get more of a stimulation of the sympathetic system with beginning depression of the parasympathetic system, with decrease of spasm and pain. So, theoretically, if these people are to smoke, they should smoke a great deal!

We used to relate hunger contractions to blood sugar. With hunger contractions we would expect a diminution in blood sugar. This has incidentally, I am told, been recently disproved. If the first statement is true, then hunger contractions are also associated with the appearance of hypoglycemia. Theoretically here, again, nicotine, by increasing the blood sugar, might have something to do with the relief of gastric spasm.

There are several things about belladonna that I should like to ask Dr. Davis. Dr. Bastedo, of Columbia, has written, as all of you know, rather extensively about the effect of belladonna on gastric ulcer, and I understand it is his belief and the belief of his group that the doses of belladonna ordinarily employed have no effect at all either on the secretory functions or the motility of the stomach. The only time when any effect was obtained was by the use of tremendously large doses—doses sufficient to dry up the secretions, produce dilatation of the pupils, and so forth. The second thing I want to ask about is the use of stramonium, which contains hyoscyamin. The hyoscyamin present in stramonium is many times more active, so far as its paralyzing effect of parasympathetic nervous systems is concerned, than atropin, which tends to predominate in belladonna.

Some investigators have used hormones in the treatment of gastric ulcers—anterior pituitrin, for instance. This has been done largely in an experimental way, and it has apparently been shown that anterior pituitrin might be of value in the treatment of peptic ulcer.

DR. D. G. CHAPMAN, Richmond: A point I should like to know about is this: If a person smokes and it produces pain, it has a tendency to increase his acidity; why is it not bad for ulcer? Why is it not bad for other things?

I think it is a question not so much of how it works in the laboratory but how it works on the patient.

DR. WILLIAM B. PORTER, Richmond: Dr. Chapman has recently written an excellent paper on the clinical action of nicotine. It is well known that nicotine decreases skin temperature following the smoking of a cigarette, which is due to the sympathetic effect rather than the parasympathetic. It is conceivable, therefore, that it has a similar action on the stomach, particularly when an ulcer exists. There is much evidence that the ulcer symptoms are in some way related to an over-action of the sympathetic system which has prompted Dr. Crile to recommend the removal of the suprarenal gland.

DR. FRANK L. APPERLY, Richmond: Dr. Cushing's work, which Dr. Horsley mentioned, is very interesting. He showed that gastric ulceration followed abnormal overstimulation of the vagus nerves, whether this was part of a general vagotonia, as in the worrying type of person (people who drive others and drive themselves), or incidental to some brain injury involving the hypothalamus (birth injuries, or following operation for basal tumors): or brought about by parasympatheticomimetic drugs.

In regard to belladonna, I have treated for some years many cases of parasympathetic over-activity with this drug, but I have never been able to produce any effect whatsoever with the ordinary pharmaceutical doses.

With regard to smoking, I am one of the parasympatheticotonics myself, and I enjoy my pipe. I think it does not matter a great deal if we do smoke, provided we do so on a full stomach, so that any swallowed irritant is well diluted by gastric contents. The early morning cigarette, however, can cause a good deal of irritation and has a bad reputation as a factor in peptic ulceration. It may be, of course, that it is only the irritable worried person (also most prone to gastric ulcer) who smokes before breakfast!

DR. OSCAR L. HITE, Richmond: I would like to say a word relative to the commonly used anti-acids in the treatment of peptic ulcers. Dr. Frank L. Apperly has shown very definitely in a paper he wrote some time ago on some experimental work among a group of medical students that sodium bicarbonate, which is so commonly used as an anti-acid, instead of being beneficial, was definitely harmful as an anti-acid. It immediately neutralizes the acid gastric contents, but, secondarily, there is a rise in the acid content of the stomach. It would be well for physicians prescribing anti-acids to bear this in mind.

Much has been said about anti-spasmodics. A great variety of anti-spasmodics have been used over a period of years. Many of them have been discussed here this morning. Among those, however, of which no mention has been made, and from which I have received satisfactory results is ephedrine sulphate.

A few years ago, a group of investigators over in West Virginia published an article in the *Journal of The American Medical Association* showing the anti-spasmodic effect of ephedrine sulphate on the stomach and intestinal tract. They had some very beautiful pictures in this article demonstrating their work. Since that time, I have used ephedrine in a great number of cases and from my observation it has been very satisfactory. I have never been a very enthusiastic user of tincture of belladonna. I realize that it is generally accepted as the best anti-spasmodic in gastro-intestinal diseases, but in my own personal experience I have not observed any startling effect from its use.

I think Dr. Davis is rather optimistic when he makes the statement that "I expect these ulcers to heal in a period of two years or less." It has been my experience that a great many duodenal ulcers never heal, or at least patients have recurring symptoms from time to time. I dare say this has been the experience of many insurance companies.

As to the use of aluminum hydroxide, I would like to state that I can see no advantage whatsoever in the use of a nasal tube and the drip method as it is being used today. The same results can be accomplished by the administration of small doses at frequent intervals by mouth, and the patient does not experience the discomfort of having to keep the tube in place constantly. If we are to use a duodenal tube, I think it would be much better to resort to duodenal alimentation as practiced by Dr. Einhorn for many years. The results obtained by duodenal alimentation in gastric ulcers are particularly gratifying. By duodenal alimentation, all foods are shunted past the ulcerated area into the small intestines, giving the ulcerated area a complete rest. A small amount of alkali is given at times by mouth.

I was hoping that Dr. J. Shelton Horsley would say something about surgery in so-called peptic ulcers, but time did not permit him. I would like to say briefly that any surgery undertaken should tend to approximate as nearly as possible the normal physiologic function of the stomach and duodenum.

Dr. Davis' subject is a timely one and the treatment as suggested by him is sound and conservative. I think he is to be congratulated upon the manner in which he treats peptic ulcers as well as the presentation of the subject.

DR. DAVIS, closing the discussion: I greatly appreciate the discussions of my paper which have been presented. So many points have been made that I can only touch on a few of them. I am aware of the fact that there is difference of opinion as to the effect of the available anti-spasmodics. They are frequently disappointing when used for relaxation of the gastro-intestinal spasms. On the other hand, there is clinical evidence indicating that they help symptoms and I am not ready to discard them. One of the speakers suggests that we might use stramonium instead of belladonna. I am afraid, however, that the cerebral effects of stramonium preclude its general use for ambulatory patients.

Someone has suggested the use of various hormones for the treatment of peptic ulcer but I am very suspicious that the effect will turn out to be psychic.

As to tobacco smoking, I am satisfied in my own mind that it is not good for a peptic ulcer. Dr. Haag has men-

tioned that light smoking produces stimulation, whereas heavy smoking may produce relaxation. I believe that the safest plan is to prohibit smoking entirely in an individual with a peptic ulcer.

My paper deals with general principles in the treatment of peptic ulcer and, naturally, I did not go into the details of treatment. The backbone of this, of course, is frequent feedings. The usual number in twenty-four hours is six but it may be necessary to feed these patients more often. During the acute symptoms I frequently awaken them several times during the night. It is very easy to determine acid control by withdrawing samples of stomach contents at various times during the day, adjusting the feeding interval according to the findings.

CLINICAL MANIFESTATIONS OF ACUTE RHEUMATIC FEVER: AGE INCIDENCE, DIAGNOSIS AND TREATMENT.*

J. FRANKLIN WADDILL, M.D.,
Norfolk, Virginia.

In spite of the many years that rheumatic fever has been known and recognized as a clinical entity, it still remains as one of our foremost clinical problems, especially among children. Contrary to public opinion the diagnosis of rheumatic fever is not an easy one to establish, especially as the well known polyarthritic variety is only one of several totally different manifestations. Added to this are the factors of recurrence following the initial attack and that the joint involvement is not the most common type of lesion in the very young. All of these serve to increase the complexity of the picture of rheumatic infection. It is not difficult to realize with this in mind that there is a great deal of rheumatic disease which is overlooked and that masquerades under a variety of other names.

Swift[1] has offered a definition of rheumatic fever as a disease of undertermined etiology characterized by a toxic state and fever and by the presence in certain organs of the body of small, disseminated focal lesions of a proliferative type. In the acute stage there is also an exudate in and about the joints, and sometimes in the pleura and pericardium. A great deal of investigation has been carried out over many years in an effort to determine the etiologic agent responsible for this infection. Much work has been done in an attempt to prove an etiologic relationship between rheumatic fever and the hemolytic streptococcus, but so far this has never been definitely demonstrated. It has been shown repeatedly that hemolytic streptococci are usually present in the naso-pharynx during the upper respiratory infection which precedes the initial attack or that ushers in a recurrence of the disease, but the organism may or may not be present during the subsequent actual period of rheumatic activity. Many observers accept the fact that there is a direct relationship between streptococcic infection and rheumatic activity, while others assert that it is a virus infection; and still another group upholds that it is the result of a state of tissue allergy to certain bacterial toxins.

Eagles[7] and his coworkers have only recently offered evidence in support of the virus etiology based on inclusion particles found in the exudates of rheumatic patients which bear close resemblance to the elementary bodies of known virus infections. Klebs[4] asserts that the allergic state is not related to the etiology of rheumatic infection. As far back as 1894 Leyden[5] isolated streptococci from endocardial lesions of rheumatic patients. Triboulet and Apert in 1898 isolated a similar organism from the blood of a patient with rheumatic fever which caused arthritis, endocarditis and pericarditis when injected into rabbits. It is known that rheumatic infection often accompanies or follows scarlet fever, and yet, in contrast, Keefer and Spink point out that in a review of 1,400 cases of erysipelas, rheumatic infection as an accompaniment or sequel was not noted in a single instance.

In view of the present contradictory and confusing hypotheses of the true etiology it seems advisable to retain the most widely accepted view at present—certainly, until a more definite one has been established. This present theory is that the disease would appear to be due to not one particular strain of streptococci, but is a systemic sensitization to the products of streptococci in some active focus of infection, and that the disease itself is a tissue reaction to the toxins or toxic products of these organisms.

The incidence of rheumatic fever[2] shows a definite relationship to geographical distribution, climate,

*Read before the sixty-ninth annual session of the Medical Society of Virginia, at Danville, Va., October 4-6, 1938.

environment and the general state of health in various classes of people. In this country the highest incidence is in the cold, damp climate of the Northern and Seaboard States. In the warmer, drier climates of the Southern and Southeastern States the incidence is very definitely less and the actual infection seems to run a milder course. Patients brought South with the disease appear to recover more quickly than if left in their usual environment. Up until recently it was stated that the disease was practically unknown in the Tropics, but not long ago several reports were published of cases in India, Australia and Southern China.

Malnutrition, poorly heated, damp living quarters and exposure are all predisposing factors, and, consequently, it is among the poorer social groups in the over-populated districts that the greatest incidence is found. The environmental factor most important seems to be that related to upper respiratory infections. In this country the highest incidence generally is from February to June, while in England the autumn months show the highest occurrence of the infection.

The severity and symptoms of rheumatic fever vary somewhat from year to year as well as over a period of many years. It is now said that there are a fewer number of cases of polyarthritis in the large, general hospitals than formerly. Girls show a higher occurrence of this infection than males, generally speaking, although in adult life this ratio is about equal or slightly reversed.

Rheumatic fever has been shown to have a familial relationship[8] or tendency. Studies of large groups by independent observers, insurance companies and clinics have demonstrated a definitely greater occurrence of the infection in families with a history of the disease than in those in which no previous history could be elicited. The greater number of cases occur between the ages of five and fifteen years, although the disease may make its appearance anywhere from birth to old age. It is said to be rare under the age of three years, but this may be due to faulty recognition of the disease at this stage of life or to atypical manifestations.

Rheumatic fever has been divided in some classifications into the visceral, joint and circulatory types, but it would appear preferable to classify it for the sake of simplicity as a disease of the general circulatory system with numerous sympotomatic manifestations. In general, rheumatic infection may occur in one of three forms:[2]

1. The monocyclic variety which is more likely to occur in adults, and is of relatively short duration, composed of a migratory polyarthritis, leucocytosis, sweating and fever. Pleuritis and carditis may occur simultaneously.

2. The polycyclic form represents several repetitions, rather close together, of the monocyclic form with a marked tendency toward cardiac envolvement.

3. The continuous state with varied manifestations which may show any combination of the numerous symptoms of the disease.

Important in its recognition is familiarity with the symptomatology and the knowledge that this shows a tendency to vary somewhat with different age levels. The polyarthritic form, while a most common manifestation of the total number of cases, irrespective of the age level, is not considered to be the common form of the disease in children. In this latter group carditis is many times more frequent as the initial manifestation. Ash, in reporting 416 cases of rheumatic fever of all ages, found a febrile polyarthritis as the initial symptom in 58 per cent. Christie, in a report of 116 cases, discovered the polyarthritic type in 68 per cent. In children, however, the joint symptoms are often entirely absent or so mild as to escape recognition, and it is this fact which is so often misleading in the detection of the presence of the disease. Symptomatically, Tyson[9] has enumerated seven different clinical forms of active rheumatic fever, including the polyarthritic variety. These are as follows:

1. Chorea—Sydenham's.
2. Carditis.
3. Recurrent acute tonsillitis.
4. Growing pains—vague muscle and joint pains in the extremities, with low grade fever and increased pulse rate.
5. Erythema nodosum.
6. Abdominal pain and cramps with nausea, vomiting and low grade fever.
7. Polyarthritis.

Any one of these forms may be present as the initial symptom, either alone or in combination with the others. While the above symptomatology appearing in an otherwise normal child does not necessarily convict him of rheumatic fever, its presence should be strongly suspected if it is accompanied by a rapid sedimentation rate, leucocytosis, sweating

and fever. Wolfe and Brim in addition to Tyson have likewise described cases of rheumatic fever in children which manifested themselves by recurrent abdominal cramps, low grade fever and nausea.

Some qualification is needed in respect to classifying erythema nodosum as an outright manifestation of rheumatic fever.[10] This skin lesion of an inflammatory nature has been pointed out as being closely related to tubercular as well as streptococcic infection. Both American and Scandinavian literature contain reports of the relation between erythema nodosum and tuberculosis, especially in children. Spink reports that in his experience, however, association between erythema nodosum and streptococcic infection, especially of the upper respiratory tract, was the more common relationship and he concludes that the lesion itself represents a non-specific inflammatory skin reaction to a variety of bacterial, toxic and chemical agents. Other observers feel that it is very definitely a link in the rheumatic syndrome. Its frequent association with both the tubercle bacillus and the streptococcus should be borne in mind and, if no evidence of tubercular involvement exists, its possible association with a streptococcic infection and an underlying rheumatic involvement should be carefully considered.

Recently there has been a growing controversy as to whether chorea is a part of the rheumatic syndrome. Coburn and Moore[11] believe that the two diseases are entirely independent of each other. It is often true that chorea is present alone with no other rheumatic manifestations, and in these instances the fever, leucocytosis, and sweating, as well as rapid sedimentation rate are absent. In the absence of these accompanying signs the evidence would appear to be against the presence of a generalized or systemic infection, such as rheumatic fever. On the other hand, in a study of 467 patients with chorea, Sutton and Dodge[12] report the presence of heart disease as a complication in 25.4 per cent of the patients who had "pure" chorea, and an incidence of 33.5 per cent in those with accompanying muscle and joint pains. They conclude from a broad study that chorea should continue to be regarded not only as a manifestation, but as a major manifestation of rheumatic infection. They feel that any relaxation in vigilance in this respect will lead to improper care of the patient and to an unwarranted decrease in clinical attention to the disease. Until further studies have shown more conclusively that chorea and the rheumatic process are unrelated, it is advisable to continue to regard an association between the two.

The onset of the actual rheumatic infection most often takes place in the following manner:

An acute upper respiratory infection followed by a quiescent interval of from one to five weeks during which time the respiratory infection may have abated altogether or markedly improved. This period is then followed by the actual onset of the rheumatic infection which may reveal itself in any one of its various forms. These symptomatic indications of the presence of the infection are accompanied in the majority of cases by both an absolute and relative leucocytosis with a definite shift to the left in the Schilling count, a rapid fall in the sedimentation rate, fever, sweating and an increased pulse rate. In some cases epistaxis and subcutaneous nodules are also given as accompanying evidences of the disease.

Now a word as to the sedimentation rate.[13, 14] There are several satisfactory methods of performing this test. Those of Cutler, Wintrobe and Westergren are extremely easy and simple to carry out, and they may be readily utilized by the general physician in his own office. It would, of course, be preferable for all sedimentation rates to be performed under a standardized technique as the calibre of bore of the tube used, as well as the volume of blood, affect the rate of sedimentation, and in this respect there is a slight variation in the range of normals. With the 5 c.c. Cutler tube the range of normal for women is given as from 2 to 10 m.m. for a period of one hour. With the tubes of smaller bore the range of normal for sixty minutes is taken to be from 5 to 20 m.m., women showing a slightly higher normal sedimentation rate than men.[15] The readings are usually taken every five minutes during the first fifteen minutes and then at fifteen minute intervals for a total of sixty minutes. Recently, the trend has been to correct the sedimentation rate for anemia, using the technique and correction chart of Wintrobe and Landsberg, although in a very recent article Cutler maintains this is unnecessary as well as incorrect for a true result. In using the sedimentation rate as a clinical test, however, it should be remembered that this test is not a specific one for rheumatic fever, but is merely an indication of the presence or absence of active infection.

To date, in spite of numerous transient enthusiasms for various remedies, no specific medication has been

demonstrated for the treatment of rheumatic infection. So far, we have no superior substitute for salicylate therapy. In spite of the universal employment of this drug its effects in this disease are not totally understood as its analgesic effects are not thought to be its sole source of benefit. At one time it was thought that a deficiency of vitamin C accompanied by bacterial infection might be an important part in producing the picture of rheumatic infection. This supposition was partially supported by the fact that Rinehart and his associates found the vitamin C content of the blood was uniformly reduced in rheumatism and rheumatoid arthritis. This theory, however, has not been supported by clinical studies. Finkle and Taylor[17] have offered further evidence to show that rheumatic fever is not directly due to the combined influence of infection and vitamin C deficiency, and that the effect of rheumatic fever on vitamin C metabolism is no different than that of any other infection.

Much interest has been felt in regard to the possible effects of sulfanilamide on rheumatic infection, and although additional reports on this will be forthcoming, the earlier ones are not encouraging. Swift and his coworkers[18] after clinical trial of the drug on a series of cases concluded that the action of sulfanilamide in rheumatic fever, when given in as large doses as could be tolerated after the onset of the disease, exercised little, if any, ameliorating influence on the course of the rheumatism. Moreover, because the toxic by-effects seem to be especially marked in patients with this infection, the drug may have a deleterious influence on the course of the disease.

Salicylate therapy, sedation and removal of foci of infection with other general supportive measures, such as a high caloric, high vitamin diet, constitute the most generally accepted and effective form of treatment. Salicylates are usually administered orally or rectally in doses of 60 to 150 grs. per day, depending on the age and tolerance of the patient. This drug, so far as is known, does not exert any specific effect on the heart. Digitalis is distinctly not indicated even on the appearance of a murmur unless cardiac failure or auricular fibrillation supervenes. The importance of proper sedation can not be too strongly emphasized, especially in the treatment of younger patients. The child with this disease should be kept in a quiet, semi-darkened room away from excitement and noisy surroundings, under constant observation during the acute stages. The level of sedation should be such that the child is awake, but slightly drowsy—quiet and in no discomfort. This is most important in the effort to avoid restless and constant movements, as well as nervous excitement with possible ensuing cardiac damage. Barbiturates may be tried, but the most satisfactory sedation of this type from the standpoint of the patient and the disease process has been obtained with the use of small, interrupted doses of codeine or morphine.

The treatment of chorea differs from the above in that very encouraging results have recently been obtained in this disease with the use of artificial fever therapy. This treatment in itself in its effects would almost appear to be specific, and where it is available it should be used early in the course of the illness in preference to other drugs and forms of therapy. When artificial heat is not available, Nirvanol[25] may be administered in doses of from 5 to 15 grs., three times a day, but in administering this drug care must be exercised to avoid any of the toxic side-effects from the drug itself. Beneficial effects have been obtained in a large number of cases with the careful use of this form of medication. However, it should be discontinued if any evidence of toxicity becomes apparent.

Frequent or serial electrocardiograms should be taken throughout the course of active rheumatic infection to determine the extent, if any, of cardiac involvement. It is not justifiable to base conclusions on the negative evidence of one or two tracings taken early in the course of the disease. The most familiar abnormality of the electrocardiogram is the widely known and recognized prolongation of the auriculoventricular conduction time, which is evidenced by prolongation of the P R interval beyond 0.20 seconds. More numerous, however, in the frequency of their occurrence are changes in the Q R S complexes and the R S-T segments. Included in these types of changes are various degrees of slurring or notching of the Q R S complex, prolongation of the duration of Q R S beyond 0.10 seconds, elevation of the R S-T segment above the isoelectric level, and inversion or isoelectric T waves in one or more leads and broadening and notching of the P waves. Other changes such as various forms of bundle branch block, sino-auricular block, A-V block, tachycardias, etc., do occur, but are not on the whole as commonly encountered as those given in the first group. Such

changes may precede any clinical evidence of the involvement of the myocardium or conduction apparatus.[19, 20, 21]

Some of the electrocardiographic changes noted, however, during the acute stages of the infection may return to normal with a subsidence of activity. Such reversible changes are usually taken as evidence that the local inflammatory process has healed without leaving behind remarkable damage or any notable permanent scarring.

The more common complications encountered in rheumatic fever are pericarditis, pleuritis and pulmonary changes. Rheumatic meningitis has been reported,[24] but this is indeed rare. The pulmonary complications are sometimes puzzling. On account of their frequency, they should be emphasized. These, as given by Poynton in Hench's article, are:[7]

1. Massive collapse.
2. Pneumonitis—simulating either a broncho or lobar type pneumonia.
3. Pleural effusion.
4. Acute pulmonary edema.

A most interesting article written by Gouley[23] has very recently appeared illustrating the pathology of rheumatic involvement of the lungs, and this article greatly clarifies the type and occurrence of the various lung complications.

One of the most important phases in the treatment and proper care of the rheumatic patient is the determination of when the patient may safely be allowed up with gradual resumption of his normal activities after the symptoms, temperature and pulse rate have returned to normal. Obviously, it is highly undesirable to enter into the convalescent stage and allow the patient to be up until all evidences of the infection have completely abated, in order to avoid the infliction of permanent organic damage upon an ambulant patient or a recurrence of the process. The best guides as to the cessation of activity are the leucocytosis, Schilling count and sedimentation rate. When these have returned to normal, it may be safely assumed that the infection is no longer active and the patient may be allowed up for gradually increasing periods, followed by gradual resumption of his normal duties or activities.

It has been pointed out by Massell and Jones[6] that in most cases the leucocytosis usually is evident in some degree even after the disappearance of clinical signs. These authors regard the leucocytosis as a non-specific reaction. It should be remembered, however, that in some instances of active rheumatic infection the total white count may remain within normal limits, but when it is elevated in the absence of other known causes, subclinical rheumatic fever should be suspected. Both the Schilling count and the sedimentation rate, however, show very little, if any, variation from the normally expected response and both of these may be taken as fairly sensitive indications of the presence or absence of infection. The Schilling count will very often return to normal from a definite shift to the left two to three weeks earlier than the sedimentation rate. The normal readings of both tests should be used in conjunction with each other rather than alone to determine the absence or presence of latent infection. In chorea,[16] as has already been noted, there is very little, if any, increase in the sedimentation rate. Myocardial failure with edema will affect the sedimentation rate in an unusual manner, causing a previously rapid rate to return toward normal, no matter how active the rheumatic process may be. The treatment of the disease as outlined should in no wise be discontinued before the Schilling ratio and sedimentation rate have returned to normal. This is a most important therapeutic precaution.

It should be realized in dealing with rheumatic disease that there is a very great tendency for a recurrence of the infection to take place after the initial attack. Children and young people, especially, are prone to recurrences of the disease. A recurrent infection may be manifested by the following:

1. Recurrent acute tonsillitis.
2. Acute glomerulonephritis.—This may be looked upon as evidence of a recurrence of the infection after the initial attack.
3. Scarlet fever is usually accompanied or followed by a recurrence of activity.
4. Acute upper respiratory infection.

Every effort should be made to protect the rheumatic patient from upper respiratory infections and active foci of infection. Any infected or suspicious tonsils or adenoids should be removed. Dental and sinus infection should be attended to promptly. While the direct relationship between rheumatic fever and focal infection has not been shown since the etiological agent of the former is as yet uncertain, yet nearly all are in agreement that active focal infection as a predisposing factor should not be disregarded—certainly, after an initial attack.

The general physician can do much for his rheu-

matic patients through a close familiarity and better understanding of the varied symptomatology, complications and frequent recurrences of the disease, and, especially, by a knowledge of the proper means of distinguishing between recovery and subclinical infection.

SUMMARY

1. The etiology and incidence of rheumatic fever have been discussed.

2. The varied symptomatic manifestations of the disease with the differences at the various age levels have been shown.

3. Therapy of the disease has been undertaken, especially in regard to salicylate, sulfanilamide and vitamin C, and, in addition, artificial fever therapy in cases of chorea.

4. Changes in the electrocardiogram have been summarized.

5. Changes in the blood sedimentation rate, Schilling ratio and leucocyte count were discussed.

6. Complications of the disease during the actual course of infection have been given.

7. Recurrences in their several forms have been reviewed.

BIBLIOGRAPHY

1. Problem of Rheumatic Fever and Arthritis: Hench *et al., Ann. Int. Med.,* January, 1938.
2. Rheumatic Fever: T. D. Jones, Mod. Concepts of Cardiovasc. Dis., Vol. 1, No. 3, March, 1932.
3. Diseases of the Heart: A Graybiel, *Arch. Int. Med.,* Vol. 61, No. 5, 809.
4. Recent Results on Rheumatic Conditions and Their Evaluation, Yearbook of Gen. Med., 1937, page 58, W. Klebs.
5. Rheumatic Fever, Stevens Textbook of Medicine, W. B. Saunders, 1928.
6. Infectious Diseases: Reimann, H. A., *Arch. Int. Med.,* Vol. 60, No. 2, 355.
7. Problem of Rheumatic Disease and Arthritis: Hench *et al., Ann. Int. Med.,* December, 1936.
8. Rheumatic Fever as a Familial Disease: Wilson, Schweitzer, *J. Clin. Investig.,* Vol. 16, No. 555, 1937.
9. Tyson, W. R.: Paper on Rheumatic Infection delivered before Post-Graduate Inst. of Phila. County Med. Soc., 1936.
10. Pathogenesis of Erythema Nodosum: W. W. Spink, *Arch. Int. Med.,* Vol. 59, No. 1, 65.
11. Independence of Chorea and Rheumatic Activity: Coburn, A. F., and Moore, L. V.: *Am. J. Med. Sc.,* Vol. 193, 1-4, January, 1937.
12. The Relationship of Sydenham's Chorea to Other Rheumatic Manifestations: L. P. Sutton and K. G. Dodge, *Am. J. Med. Sc.,* Vol. 195, No. 5, 794.
13. Approved Laboratory Technique: Kolmer and Boerner, 1931 ed.
14. Standardized Technique for Blood Sedimentation Test: Wintrobe, M. M., and Landsberg, J. W., *Am. J. Med. Sc.,* Vol. 189, No. 102, 1935.
15. Textbook of Clinical Pathology: R. Kracke, 1938, W. Wood & Co.
16. The Influence of Anemia on Blood Sedimentation: J. W. Cutler, *Am. J. Med. Sc.,* Vol. 195, No. 6, 795.
17. Finkle and Taylor: *Ann. Int. Med.,* Vol. 10, 1867, 1937.
18. Sulfanilamide Therapy in Rheumatic Fever: Swift *et al., J. A. M. A.,* Vol. 116, 426-434, February 5, 1938.
19. Clinical Electrocardiography: H. E. B. Pardee, 1933, Hoeber.
20. C. C. Maher: Electrocardiography, 2nd Ed.: W. Wood & Co., 1937.
21. Clinical Electrocardiography, 5th Edition, T. E. Lewis: Shaw and Son.
22. Blood: A Review of Recent Literature: F. H. Bethell *et al., Arch. Int. Med.,* Vol. 61, No. 6, 923.
23. Evolution of the Parenchymal Lung Lesions in Rheumatic Fever and Their Relationship to Mitral Stenosis and Passive Congestion: B. Gouley, *Am. J. Med. Sc.,* July, 1938.
24. Acute Rheumatic Meningitis: Goffrey Bourne, Yearbook of Gen. Med., 1937, page 60.
25. Nirvanol Treatment of Chorea: S. W. Marick, *J. Pediatrics,* 51:242, February, 1934.

Wainwright Building.

DISCUSSION

DR. A. B. HODGES, Norfolk: Every year there are admitted to the hospitals of Norfolk a number of patients suffering from rheumatic fever. Acute carditis is by no means rare, but polyarthritis in its classical form is uncommon. Rheumatic heart disease, of course, is very prevalent. There is great disparity between the number of cases of acute rheumatic fever and those of rheumatic heart disease. This means that often the disease in its early stage is missed.

How can we recognize the early manifestations of the disease? How can we differentiate the beginning of rheumatic fever from the acute upper respiratory infections? In acute rheumatic fever there is tachycardia, an irregular low-grade fever and prostration. Often the blood shows an increase in premature leucocytes and a rapid sedimentation rate. Often the electrocardiogram will show certain characteristic abnormalities.

DR. PAUL CAMP, Richmond: I should like to say just a few words. I did enjoy Dr. Waddill's paper, and he certainly went into the subject in very great detail. I think if we could make a scientific study on all the cases like that it would be very nice. Unfortunately we cannot do that, and by not being able to carry out all of these detailed studies we certainly miss a lot of these cases. As Dr. Hodges said, there are certain types which we overlook. I am more convinced of this by seeing cases later that have developed definite evidence of so-called rheumatic heart disease, in which there is no definite history

of any real rheumatic infection. I do not want to bore you with any statistics here, but when I was working with Dr. Grant, in England, their classifications, or, rather, their criteria, were a little more rigid; and they did not consider anything as rheumatic heart disease unless there was a real history of polyarthritis or chorea or unless at autopsy Aschoff bodies were present. Taking that group as real rheumatic heart disease, we found there were ninety-seven of such cases showing the necessary history and developing a real mtiral stenosis, whereas there were 141 with similar findings of mitral stenosis but without a definite history. Similarly, there were seventy-one cases with aortic regurgitation with a definite history which we classified as rheumatic fever and 121 with indefinite etiology. Therefore, if you follow them through you will see there are over half the cases which do not give a definite history of rheumatic fever. Paul White says that in 70 per cent you probably get a definite history of rheumatic fever and in from 5 to 10 per cent get a definite history of chorea. That, to me, shows there are undoubtedly a large number of cases which in the past have had rheumatic infection which was not recognized. I think, however, the pendulum may be swinging too far the other way now and that all these cases certainly cannot have what we classify as a rheumatic infection or rheumatic fever just because they have a bad cold or something like that. Because we do not know the etiology of rheumatic fever we have to prove they have rheumatic fever or chorea or else have to prove at autopsy they have Aschoff bodies. I used to think that in the South there was a large group which have a mild type of infection which would eventually develop into rheumatic heart disease. I still think that this group exists and by protecting those patients and giving them more rest we may be able to prevent the development of rheumatic heart disease. If you want to use the term "rheumatic state," they might be so classified. Certainly there remain a large group which, though with rheumatic symptoms, will not in the end develop true rheumatic heart disease, I believe.

In regard to the treatment, I think undoubtedly the most important thing, as Dr. Waddill and Dr. Hodges have both emphasized, is rest. I think a lot of common sense has to be used along with all our laboratory procedures, because even after the pulse rate is down and the temperature is normal and we hope to get the laboratory procedures normal, I think if we would be more conservtative and keep the patients in bed a longer time they would be better off in the end. The more we learn about rheumatic fever, or rheumatic manifestations, or whatever you choose to call it, the more we are coming to the idea that, like tuberculosis and like syphilis, it is a chronic infection and that, even though it may become inactive, it is probably smoldering and the least infection will cause the patient to have a flare-up of untoward symptoms. I do not think, however, that every upper respiratory infection means there is a re-infection. I suppose Dr. Waddill means the same thing, that where you get an upper respiratory infection you do get a definite reaction which is probably allergic in nature; but again, until we know what causes rheumatic fever, I do not see how one can say it is a recurrent re-infection unless we get rheumatic myocarditis or pancarditis or chorea or some of the other known manifestations.

I should like to ask if you think that salicylates have any curative value in the treatment of rheumatic manifestations, and if you think those electrocardiograms are characteristic of rheumatic fever.

DR. E. B. ROBERTSON, Danville: I enjoyed Dr. Waddill's paper very much. Just three things occur to me that I think it might be worth while to mention. I had rheumatic fever, and I was treated by a man that thought the salicylates neutralized the toxins. He gave me 120 grains of salicylates a day for three weeks, and it certainly was a bad experience. I think it is worth bearing in mind that you sometimes do harm by pushing the salicylates too far. There is no question that adequate diet is a very important thing, and it is a tremendously hard thing to take a full diet when you have had too much salicylate. Another thing I want to mention is that it seems to me the older patients I see who have had rheumatic fever apparently seem to have had more severe joint manifestations than the younger ones. I saw a woman a short time ago who is now sixty-nine. She had auricular fibrillation and mitral disease, and I asked her if she had had any joint manifestations when she was a child. She said not, but she remembered distinctly lying on the ground and crying with growing pains. I do not recall seeing children, or certainly I have seen very few children in this climate, who had either severe growing pains or joint manifestations.

There is one other point. I believe it is generally admitted that rheumatic fever is, as a rule, a disease of the poorer class. I cannot recall having seen a case of rheumatic fever that did not come from among the lower classes or lower-income groups, where one would assume that the diet is not adequate, or, if they did come from the higher-income bracket, it seems to me that every one I have ever seen was, the parents told me when I pressed them, a child who was choosy about his diet, and they let him eat what he wanted rather than make him eat what he should.

DR. F. C. RINKER, Norfolk: I wish to ask Dr. Waddill to cover one point in closing. We know that infections should be removed. The family physician and the family and the patient, particularly, are interested to know when that should be done, because so frequently following surgical intervention for the removal of foci of infection there is a recrudescence of the original disease; and it seems to me he might touch upon the point of approach of the blood findings to normal before any surgical work is attempted.

DR. WADDILL, closing the discussion: In answer to Dr. Camp's first question, as to whether salicylates are specific in the treatment of rheumatic fever, or not, I am unable to answer that because I do not believe, as I said, we fully understand what salicylates do. There is as yet no evidence with which I am familiar showing that salicylates

exert any specific effect on the infection. They do, of course, have an analgesic effect, as you all know, but I do not believe we can answer whether salicylates are in any way specific for the infection locally or generally. As to my own personal opinion, I do not believe they are, but I do think that salicylates are perhaps the best drug we have at present with which to treat the infection.

With regard to whether the electrocardiograms shown are specific for rheumatic fever, emphatically no, because those you saw on the screen were not specific for any one type of infection. I pointed those out merely as showing certain myocardial changes and conduction changes, and of course those changes can occur in other conditions. If, however, they occur in the course of an acute rheumatic infection, they are interpreted to mean that that infection has reached either the myocardium or some part of the conduction apparatus.

Of course not all respiratory infections, even in the rheumatic patient, are evidence that the disease is again present. As Dr. Hodges brought out, I think the important thing is to watch these cases of upper respiratory infection, especially in rheumatic patients, and where we see a severe upper respiratory infection with fast pulse and some prostration of the patient, I think there is a suspicion that more than an upper respiratory infection exists. I think they can be differentiated somewhat on the basis of whether the leukocyte count is elevated or not, because, as you are all aware, ordinary grippe or "flu" is accompanied not by leukocytosis but by a leukopenia in the uncomplicated cases. The sedimentation rates, on the other hand, either in grippe or "flu" or even in chronic tonsillitis or chronic focal infection, are not depressed to the level they are in a rheumatic infection, so I think those clinical facts, as well as the interpretation of the two tests, will help a great deal in telling us with what we are dealing in simple or complicated upper respiratory infections.

It is perfectly true that in giving salicylates we do have to watch out for the side-effects of the drug. That can be gotten around a little bit by giving sodium bicarbonate with the sodium salicylate, to help relieve the gastric effects; or we can give the drug by rectum, which helps still further to get away from the upsetting effects of large doses of salicylates on the gastrointestinal tract. I fully agree that in young patients of small stature and weight the giving of salicylates can be overdone.

As Dr. Rinker, I believe, brought out, the handling of focal infection in a rheumatic patient is to treat the focal infection locally during the duration of the disease and not attempt surgical treatment until the white count and the sedimentation rate are all on the normal line.

ALCOHOL OR CANDY.*

BEVERLEY R. TUCKER, M.D.,
Richmond, Virginia.

It seems a pity that a substance which has brought so much pleasure and conviviality into this weary world as alcohol should have by its abuse also brought untold misery and suffering. But, finishing the title of Dr. Strecker's recent book, *Alcohol, One Man's Meat*—is another man's poison.

The ramifications of the endeavor to handle the alcohol problem are vast. Out of the attempted solution has grown hate—the hate of those who do not drink for those who do and the hate of those who do for those who advocate total abstinence. In truth the whole question is usually approached with emotion rather than with reason. And so the silly "noble experiment" of prohibition was fostered upon an unthinking and an immature nation—an experiment that created bootleggers, set up hypocrisies, fathered political corruption, nurtured gangsterism, and hugely increased drinking. Nor was the question solved by the overthrow of prohibition. Many of the hangovers of our national spree of prohibition are still with us and some sovereign states have sublimated by going into the liquor business! So each individual will have to work out his or her own liquor problem, bearing in mind that those who sing "One more drink won't do us any harm" are probably creating a problem for themselves.

Statecraft, law, uplift, and ballyhoo having failed, it may be up to medicine to play her hand even this late in the game. Let us admit in the beginning that medicine has been dealt a rather bad hand, that on the whole she has been a poor player, and that in drawing she has not filled any straights, flushes, or full houses. Medicine in this state has been bluffed by a poker-faced legislature in ordering a book to be written by representatives of the state's two great medical schools, which, when produced, although highly instructive and potentially of great benefit, was ill-advisedly cast aside. This book, *Alcohol in Moderation and Excess* by Doctors Waddell and Haag,—Strecker's *Alcohol, One Man's Meat*,—Emerson's *Alcohol and Man*,—and other medical

*Read before the Richmond Academy of Medicine.

writings are all helpful in the attempt to understand the subject of alcoholism. But there is still much to learn.

The present paper is preliminary and only intended to be suggestive. To clear the ground it may be well to state a few of the mooted questions. It has been said that alcohol is not a stimulant; still, many of us believe that under certain circumstances it is. I remember very well, when I was an intern, seeing a post-operative case suddenly collapse and become pulseless and cyanotic. As nothing else was immediately available I drew up a hypodermic syringe full of French brandy, which happened to be on the bedside table, and injected it subcutaneously, and then another syringe full. In a few moments the pulse began to come back, then the cyanosis rather rapidly cleared, and in a few minutes circulation was reestablished. It has also been stated that alcohol has no place among medicinal remedies, but whoever thinks that is so can hardly have closely observed its use after influenza or pneumonia, after exposure to cold, in cases of anorexia, or in the various states and conditions attending old age. But it is not to questions of this sort that I shall address myself.

What is meant by the term alcoholism? Surely not the occasional or the moderate libation of alcoholic beverages! However, one must realize that to many individuals alcohol is a dangerous and a habit-forming drug. But one must also realize that its action is peculiar in that it may be chronically habit-forming in one individual and temporary in another, hence the chronic and the periodic alcoholic. I shall not here discuss the intoxicating and deleterious effects of alcohol either somatically or socially for they are only too well known. I feel that we as physicians have adopted too much of the layman's attitude toward the unfortunate victims of alcohol and that we apply to them an emotional reaction of compassion or disgust rather than the more scientific viewpoints of cause and prevention.

The doctor who is called to see a so-called "drunk" and gives him a "shot" of morphine or loads him up with paraldehyde, reduces more or less gradually his alcohol and sobers him up to get "drunk" again, has not done his duty to the patient, to medicine, or to society. It may be that this "drunk" is a constitutional defective and a menace to society and needs to be for a long period or permanently in an institution. It may be that he is a psychoneurotic with weak resistance and is frustrated by the ordinary impingements of the vicissitudes of life. It may be that he is an average man upon whom the hand of devastating fate has laid so heavily that he feels he has to obtund his consciousness with alcohol. It may be that from without a nagging wife (or in a woman an inconsiderate husband) or from within a guilt sense makes the escape into alcoholism seem imperative. Most of us have poorly developed inhibitions. Or, on the other hand, may there not exist a hypoglycemic state which is starving the patient of sugar and for the satiation of his hunger he turns to whiskey rather than to candy? Under any circumstances *the alcoholic has a cause for his alcoholism* and it is up to us to endeavor to find out if possible what that cause is.

In an attempt to find out if there is not a group of alcoholics who are sugar-starved I shall first make a few general observations in which I think you will agree. It seems to be generally observed that most hard drinkers do not care for sweets. Is it not so that shortly after national prohibition became effective and until bootlegging became firmly established there was a period of "boom" for all of the manufacturers of candy? With these observations in mind I have queried a good many alcoholics and only the day I am writing this a periodic alcoholic told me that he ate no sweets while drinking but that as soon as he stopped he ate candy for a while by the pound. Some have told me that they would stave off drinking for a while by eating an excess of sweets. I have also observed that the men who put sugar in their liquor did not seem to imbide as heavily as the whiskey and water or highball drinkers. Certainly one sees more drinking among straight or highball whiskey or gin drinkers than among cocktail, punch, wine, and toddy drinkers. And, I believe, the individual with a "sweet tooth" may induce dental caries but rarely fills a drunkard's grave.

If the statements above made have any virtue to them, then it behooves us to try to substantiate them. My experience is very limited and I look to those of you who can to help me in this investigation.

Masters,[1] in 1935, in a paper on sugar metabolism, felt that there was an apparent relationship between cerebral oxygenation and the sugar level and called attention to the fact that if oxygen is administered just after an intoxicating dose of al-

[1] *Southern Medical Journal*, March, 1935, Vol. 28, No. 3, pp. 254-258.

cohol is given no symptoms of intoxication appear. I think, then, we may draw the inference that if sugar, which should increase the cerebral oxygen, is given, the intoxicating effect of alcohol should be less.

Bastedo[2] states that alcohol can spare or replace carbohydrates in the food for a time. Alcohol or whiskey of itself does not contain sugar in an appreciable quantity. In looking over one hundred and forty-five papers and books on alcohol and alcoholism, I could find only one paper throwing any light or experience in studying blood sugar or sugar tolerance in alcoholics. Edkins and Murray[3] describe experiments in which they compared the tolerance of three persons to 75 gm. of dextrose taken alone and with alcohol. They noted that the alcohol increases absorption, as shown by a more rapid rise in blood sugar. After alcohol the sugar in the blood falls more rapidly. I could find nothing of importance upon the therapeutics of giving glucose or other sugars for the correction of alcoholism.

The chemical formula for alcohol and that for carbohydrates is closely related:

C_2H_5OH—ethyl alcohol

$C_6H_{12}O_6$—dextrose or glucose

$C_{12}H_{22}O_{11}$—cane sugar.

It would seem that moderate ingestion of alcohol does not elevate the blood sugar, but that excess probably does.

Another question is, what is the fasting blood sugar of an individual who has been a chronic alcoholic and has been taken off of alcohol for a considerable period? This is best illustrated by one of our recent cases—a young man of twenty-five who had been drinking quite steadily since he was fifteen years of age. After he had been taken off of alcohol for two weeks his blood sugar was 58 mgms. In a few days a sugar tolerance test was done which was as follows: at one hour intervals his curve ran—fasting 60.5 mgms.; 65 mgms.; 52.5 mgms.; 47.5 mgms., 57.5 mgms.; and 55 mgms. Then he was put on two pieces of cream-mint candy about three-fourths of an inch square thrice daily and his craving for drink left and his blood sugar came up to 70 mgms., but he still had some lack of energy. His candy was increased to three pieces three times daily and he was given pancrépatine. In twelve days his blood sugar rose to 82 mgms. Before he left he had been all over town by himself for a month, had not taken a drink, did not crave a drink, and had regained his energy.

In the treatment of *acute alcoholism* we have been saved much trouble, instead of giving the patients hypnotics and narcotics and gradually reducing the alcohol, by treating them as follows:—When we see a patient who is acutely intoxicated, whether he has been drinking a short time or a large quantity over a considerable period, we give him 50 cc. of 50 per cent glucose intravenously or sometimes the same quantity of sucrose (sucrose is thought to give less later increase in the cerebro-spinal fluid pressure) and none or one drink of whiskey. If he comes under treatment at night we give him the same quantity of glucose the next morning followed in twenty or thirty minutes by 15 or 20 units of insulin. Insulin seems not only to help regulate the metabolism, but also to act as a sedative and enable the patient to take more nourishment. As a rough rule, those patients accustomed to one pint of whiskey a day require glucose two or three times and insulin once or twice; those taking a quart a day require more, the glucose and insulin being regulated by the patients's condition. Nearly all patients are off of alcohol from the time they come under treatment or have one or two drinks for a day or two, and they sober up as a rule in twenty-four hours. Those who are what they call "jittery" or are not eating well get insulin, ten or fifteen units three times daily before meals, for a few days longer. If a patient looks as if he is going to develop delirium tremens, and there are only a few of them who do if started on glucose and insulin, we do lumbar puncture drainages. If depression and tremors are marked symptoms we give benzedrine sulphate, 10 mgms., orally two or three times in the A. M. several hours apart.

If a patient has an enlarged liver or if the blood sugar is persistently low after taking him off of alcohol, we have given one or two cases either pancrépatine which contains the enzymes of the pancreas and the liver, or suprarenal gland extract, in the hope of making more available to the body tissues the glycogen stored up in the liver.

In chronic wet-brain cases we give them either hypertonic 50 per cent glucose, followed by frequent, often daily, lumbar puncture drainages, or 250 cc. of 25 per cent glucose followed by spinal drainage in four hours. In a recent case a patient who does not

[2]Materia Medica, Pharmacology and Therapeutics—Bastedo (1932). W. B. Saunders Co.

[3]*Jour. A. M. A.*, Vol. 97, p. 281 (1931).

remember anything at all about his first several weeks in the hospital and who was for weeks delusional, hallucinatory, and confused, regained his orientation and his mind cleared. He was able to go home in several weeks more and resume a very responsible financial position.

Among the most interesting alcoholics are the periodic drinkers. Individuals of this sort are often brilliant and accomplish a great deal during their abstinence. The desire to drink comes over them apparently without cause and many of them after weeks of heavy drinking will stop as suddenly as they began. Undoubtedly some of these cases have manic depressive psychosis and they drink to help overcome their depression, but I am persuaded that others are due to deficiency in sugar metabolism and instead of turning to sweets they turn to liquor. To illustrate: One was a non-drinker, a man who told me he would go for a considerable time at top speed with heavy responsibilities and then he was so exhausted that he felt he must get some relief and he found he got relief by eating candy for a while, as much as a pound a day. Some periodic alcoholics, like many, were very intellectual and their work necessitated being under considerable strain, usually more or less of an emotional character. After these strains they would take to liquor, and then of themselves would quit it short and would not want nor take any more until the next period of exhaustion. In several of these, when I could get them to have it tested, I have found a lowered blood sugar. The trouble is that it is hard to get them to come in for a fasting blood sugar just previous to a spree.

But the giving of sugar and the glucose-insulin treatment with or without spinal punctures is not all to be done for alcoholics regardless of type. Hydrotherapy baths are helpful in all cases and so is full nourishment. A thorough medical and neuropsychiatric examination is necessary. Enlarged livers, nephritis, neuritis, and other conditions often come to light and require special treatment. To thoroughly study a case an adequate neuropsychiatric history is essential and should be followed by psychotherapy and a process of re-education which as a rule has to be applied to the family as well as to the patient. A study of the carbohydrate metabolism and of the patient's habits as to eating sweets should be uniformly made. The confidence of the patient should be so gained that he will report when required, even though he may have been perfectly sober for varying periods, for a blood sugar and at times a sugar tolerance check-up.

In closing let me say that I, of course, do not for an instant intend to imply that alcoholism is simply a question of hypoglycemia, but I do believe that there is a group, how large I do not know, of both periodic and chronic alcoholics who drink because of a blood sugar deficiency and who can control their alcoholic propensities if they take sufficient carbohydrates. If this proves to be so the title of this paper is not facetious.

212 West Franklin Street.

BRONCHIECTASIS: A CONSIDERATION OF ITS CAUSES AND ITS PREVENTION.*

LOUIS H. CLERF, M.D.,
Philadelphia, Pennsylvania.

Bronchiectasis as it is commonly observed usually is secondary to other causes. It may occur congenitally as a primary condition. It is important to bear in mind that non-tuberculous bronchiectasis commonly involves a lower lobe; begins in the smaller bronchi; is relatively common in children; the symptoms and physical signs in the early cases are not characteristic and diagnosis often is difficult. Since bronchiectasis commonly is secondary to previous disease its causes and prevention should afford a wide field for study to the general practitioner as well as the internist who is interested primarily in pulmonary disease. In discussing these phases it is important to say a word concerning prognosis, methods of diagnosis and also results of treatment.

It is difficult to give a satisfactory prognosis. There are few reports in the literature; the number of patients studied is small and the cases have been observed for relatively short periods. It is the general opinion, however, that bronchiectasis increases

*Read as part of the Symposium on Diseases of the Chest at the meeting of the Southside Virginia Medical Association, March 21, 1939, at Franklin, Va.

morbidity, that serious complications may develop and that often the disease leads either to early death or chronic invalidism. The late Professor Thomas McCrae was quoted as stating that "if he were afflicted either with bronchiectasis or tuberculosis he would prefer tuberculosis!" This gives one an insight into the serious nature of bronchiectasis.

In the advanced case the diagnosis usually can be made without difficulty. Obviously this type of case can be offered little from the standpoint of treatment. Diagnosis to be helpful should be made in the early stages of the disease. Cough is commonly productive although in children there may be no sputum expectorated. There usually are auscultatory findings over the involved lobe or lobes. The roentgen ray appearances although not characteristic in early cases usually exhibit heavy root shadows with increase in the bronchial markings. In the obstructed forms there may be clinical and roentgen ray evidence of atelectasis or of pulmonary fibrosis. The most important diagnostic measures consist of the instillation of iodized oil into the affected bronchus or bronchi followed by roentgen study and bronchoscopy, particularly when there is evidence of bronchial obstruction. In the early, non-obstructed case bronchoscopy gives relatively little positive information. Many methods of introduction of iodized oil are practiced. It is important that the oil be instilled into that portion of the air passages that is to be mapped. In all forms of obstructive bronchiectasis a bronchoscopic examination is necessary in order to make an etiologic diagnosis and also for a consideration of the plan of therapy to be instituted.

Medical treatment, which includes rest, postural drainage, vaccine therapy, bronchoscopic aspiration, various forms of medication, intralaryngeal instillations of iodized oil or other medicaments, removal of foci of infection and irradiation is, as a rule, not curative, although much can be accomplished to prevent extension of the process. Under favorable conditions the bronchial infection may be reduced but the bronchial dilatations remain more or less permanently. As a result reinfection with recurrence of all the symptoms is common. The only plan of treatment that is curative is surgical amputation of the diseased portion of lung. This too has its limitations.

With this brief résumé of bronchiectasis its causes will be considered. In the older textbooks there is much thought given to the influence of cough as a distending force. While this may exert some influence, it undoubtedly is of secondary importance. In my opinion the two outstanding factors in the etiology of bronchiectasis are infection and obstruction of a bronchus. Obstruction undoubtedly plays a very important part since it is associated with retention of secretions which commonly become infected and interference with drainage and normal pulmonary ventilation. This has been repeatedly demonstrated in patients who had aspirated foreign bodies into the bronchi. In a study of a considerable number of patients in whom bronchial foreign bodies lodged in the bronchus for a considerable period of time, producing bronchial obstruction with retention of secretions and infection of the lung distal to the point of obstruction, it was found when iodized oil was instilled following removal of the foreign body that in practically every case there was bronchiectasis. This has also been observed in cases of bronchial obstruction secondary to broncholithiasis and benign tumors. The triangular area of atelectasis commonly observed in the right costophrenic angle of children usually represents bronchial obstruction due either to inflammatory tissue, inspissated secretion or peribronchial lymphadenitis with compression stenosis. If these are investigated bronchoscopically and ventilation and drainage instituted and later iodized oil is instilled it will be found that there often is present bronchiectasis. If the atelectasis is of long duration one can be assured that the bronchi are dilated. The causes of non-obstructive form of bronchiectasis are not so readily explained since there is an absence of bronchial obstruction and on bronchoscopy one finds a patent bronchial tree. Often there is no history suggesting pulmonary infection other than measles with a complicating broncho-pneumonia occurring in childhood. It is quite possible that the bronchopneumonic process was associated with production of thick secretions which produced temporary bronchial obstruction. It is also quite possible that the pneumonic process involved the peribronchial tissues with secondary changes in the bronchial wall, replacement of elastic tissue by fibrous tissue and ultimately the development of bronchiectasis. It was clearly demonstrated during the influenza epidemic of 1918 that bronchiectasis developed early in the course of the so-called influenzal pneumonia. It was shown at post-mortem performed on those dying during the third or fourth day of the influenzal pneumonia that bronchi in the affected area were dilated to six and eight times the size of the normal lumen. Obviously

one cannot state whether patients recovering from pneumonia without a complicating bronchiectasis exhibited bronchial dilatations during the course of the pneumonic process.

The influence of disease of the accessory nasal sinuses on bronchiectasis is a perplexing question. Although much work has been done to demonstrate lymphatic pathways it is very probable that there is no transference of infection by this route. Aspiration of infection into the trachea probably could be considered a predisposing factor. More often, however, the patient with sinus infection, particularly the child that might be described as being of a lymphatic type, appears to be predisposed to acute respiratory infections. It is not uncommon to elicit a history of several attacks of pneumonia during the course of a winter. There usually is a severe bronchial infection, probably a broncho-pneumonia, and under certain conditions this is followed by a bronchiectasis. The more frequent employment of bronchoscopy and iodized oil for lung mapping and investigation of the accessory nasal sinuses of children who frequently contract acute pulmonary infections would be helpful in ascertaining data on this subject. Too often we see these patients a number of years after the onset of the disease when there is an extensive bronchiectasis and chronic sinus infection.

The question of allergy has been raised in these cases. While little investigation has been done it would seem that this matter should be studied particularly in the non-obstructive forms of bronchiectasis.

"An ounce of prevention is worth a pound of cure." In bronchiectasis, prevention is worth infinitely more than this and every effort should be made to recognize certain of the predisposing and exciting factors so that appropriate measures could be instituted early. It would seem obvious that prompt relief of bronchial obstruction would do much towards preventing the development of complications, notably bronchiectasis. It has been the experience of everyone doing bronchoscopy for foreign body that lung changes distal to a recently aspirated obstructing bronchial foreign body are slight and recovery usually occurs promptly when the object is removed. In the long duration case associated with bronchial obstruction, however, there usually is present bronchial suppuration and roentgen ray evidence of extensive pulmonary change. While removal of the obstruction commonly is followed by remarkable improvement, suggesting complete restoration of pulmonary function, if iodized oil is instilled for diagnostic purposes a majority of these patients will exhibit bronchiectasis.

A number of cases of benign neoplasm have been observed in which there were symptoms of cough and expectoration of large quantities of pus. It was of interest to note that in certain of these the primary diagnosis was pneumonia. With failure of the area of apparent consolidation to clear the diagnosis was changed to unresolved pneumonia. More often than not, unresolved pneumonia never was preceded by pneumonia; rather, there was bronchial obstruction with pulmonary infection which exhibited certain of the signs of pneumonia. In these, bronchoscopy is a very important aid not only from the standpoint of diagnosis but also for the purpose of treatment.

To summarize briefly, every case of bronchial obstruction should be considered as a potential case of bronchiectasis. The causes of bronchial obstruction are numerous. It may be produced by aspirated foreign bodies, new growth—either benign or malignant,—accumulation of bronchial secretions as in postoperative pulmonary atelectasis, or in pneumonic processes, particularly in children, granulation tissue developing during the course of an acute pulmonary infection, broncholithiasis and compression stenosis from peribronchial neoplasm, inflammation or tuberculosis.

Areas of atelectasis should be recognized promptly and should be interpreted in terms of bronchial obstruction rather than unresolved pneumonia. Failure of an area of atelectasis to clear promptly following medical measures should be considered as an indication for bronchoscopic investigation both for purposes of diagnosis as well as treatment. Delay promotes retention and stagnation of secretion, infection of the bronchial wall and ultimately the development of bronchiectasis.

1530 Locust Street.

NUTRITIONAL DEFICIENCY DISEASE—WITH SPECIAL REFERENCE TO VITAMIN B DEFICIENCY.*

OSCAR L. HITE, M.D.,
Richmond, Virginia.

The subject of nutrition is becoming more engaging to the educated public each year, and the medical practitioner must not only be able to prescribe diets in specific illnesses, but also it behooves him to be able to translate into everyday language those factors which fulfill the requirements of a perfect diet in answer to the queries of his intelligentia.

The intelligentia are aware of the fact that nutritional deficiency disease is due to an inadequate supply, faulty absorption or improper utilization of essential elements normally found in the body. I think it is generally recognized by the layman that pellagra. scurvy and beri-beri are states of health produced by an inadequate supply of vitamins. This lay understanding has resulted from a tedious process of education carried forth by the clinician. Physicians themselves are not possessed with a complete revelation of all of the clinical manifestations which confront them, but investigation and research are slowly and accurately clearing the debris from about us. Only recently have we come to recognize many of the deficiency diseases and their ramifications. We have been almost as slow as Pasteur's adversaries in accepting the "newer concept" of the pathogenesis of many clinical manifestations observed daily. It would be impossible in the scope of this paper to discuss fully all nutritional deficiency diseases; therefore, I shall limit my discussion to a few of the proven vitamin B deficiency diseases.

Our concept of vitamin B, until recently, has been rather limited. Within the last few years its chemical nature has been shown to be a complex one, many of its components having been synthesized, and are available for therapy in specific vitamin B deficiency diseases.

A great many patients, presenting themselves for medical attention, are suffering as a result of some form of vitamin B deficiency. There are many factors coming into play in the production of this state of health. It would be well to consider a few of them briefly.

*Read before the sixty-ninth annual session of the Medical Society of Virginia, at Danville, Va., October 4-6, 1938.

The body reserve supply of vitamin B is a variable factor in different individuals; many of us are prone to have likes and dislikes in the matter of eating vegetables which are the chief source of vitamin B. The preparation of vegetables likewise has much to do with the vitamin content; more especially if they are boiled in water and the water is thrown away. Vitamin B being water soluble, much of it is thrown away with the "pot liquor". Therefore, the quantity ingested may be deficient either as a result of faddism in diet or in the preparation of the food. Pellagra is probably the most common disease seen in the South, resulting from faddishness in diet. This disease is no respector of persons or walks of life. It is generally accepted that it occurs in those people who fail to ingest an adequate supply of the P-P- factor of vitamin B.

The body supply of vitamin B may be depleted by certain toxic conditions which either interfere with the proper absorption, or it may be eliminated before it is absorbed. I have in mind such states of health as might produce nausea, vomiting, or diarrhea. There are also conditions of the body requiring a greater amount of vitamins and mineral salts than would be necessary under basal conditions. In this category one would consider such conditions as pregnancy, lactating mothers, hyperthyroidism, and the laboring class of individual. Under such circumstances the basal requirements would have to be augmented. On the other hand, the supply might be sufficient, but for any one of several reasons the absorption might be faulty. In any type of toxemia there is an impairment of absorption of all kinds of food materials. The mucosa of the intestinal canal may become irritated from many causes and as a result its absorptive powers will be impaired accordingly. This is certainly true in the late stages of sprue, beri-beri, pellagra and Addison's disease. Often, in our efforts to overcome some symptom of our patients, we resort to devious means. This is particularly true in constipation. We employ every drug from mineral oil to calomel. I am confident that in every instance we insult or impair the absorptive powers of the intestinal tract. There is definite evi-

dence that mineral oil retards the absorption of vitamin B from the intestinal canal.

The supply of vitamin B may be adequate and its absorption perfect, but it may not be properly utilized by the tissues of the body and a deficiency state of health ensues. It is thought that a diet high in carbohydrate content will retard the utilization of vitamin B by the body tissues. This is questionable, however, since it has been shown that if the two are properly balanced a deficiency state will not develop in animals. One author expressed the opinion that vitamin B acted as a catalytic agent in the presence of a high carbohydrate diet and all that was necessary to prevent a deficiency disease from developing was to have a sufficient amount of vitamin B present in the diet. At any rate, vitamin B plays some role in the metabolic transformation of carbohydrate in the organism. Just exactly what occurs in the toxemias of various sorts is not clearly understood. We are all aware of the anæmia and neuritis which develop in lead poisoning, but we are uncertain as to the exact nature of the pathological physiology. Iron alone is not an antidote for such an anæmia, nor are we certain that the neuritis is due to the toxic effect of the metal lead, or whether it is due to an insufficient amount of vitamin B.

Thus far we have considered several factors which play a role in the production of avitaminosis. The most common manifestation of avitominosis B_1 is anorexia and gastro-intestinal hypotonicity. It has been clearly demonstrated that deprivation of vitamin B_1 in the diet results in the loss of the urge to eat. The loss of the urge to eat may be partial or fairly complete. I do not mean by this, however, that anorexia is entirely dependent upon the presence of vitamin B_1 in the diet, for there are other essential elements in a basal diet, but in laboratory animals the loss of appetite is commonly the first symptom of vitamin B_1 deficiency to occur. The sequel of vitamin B_1 deficiency is anorexia and intestinal hypotonicity. Cowgill, Devel, Plummer, and Messer established the association of gastric atony with vitamin B deficiency by the use of a gastric fistula in dogs. By fluoroscopic examination of the intestinal tract of these dogs they demonstrated a hypomotility. From this experiment one would be justified in making the deduction that atonic constipation was a common symptom of vitamin B deficiency.

Little will be said about achylia and achlorhydria, for they are generally recognized as being associated with vitamin B deficiency.

Hoobler states that "mild symptoms of infantile beri-beri are quite common in this country." He has shown that both human and cow's milk are deficient in vitamin B content. Furthermore, he describes the symptoms of "partial vitamin B deficiency in infants as anorexia, loss of weight, spasticity of the arms and legs, rigidity of the neck, restlessness and fretfulness, and a strange plaintive cry." Upon the addition of vitamin B to the diet, he noticed that after two weeks "the infant changed from a fretful, pale, spastic, whining baby, refusing part of its food, to a happy rosy-cheeked, smiling baby, whose appetite never seemed completely satisfied and whose gain in weight was remarkable." He concludes that every baby should have vitamin B added to his diet and "it should not depend upon milk, either human or cow's, as its only source of this vitamin." This report and experience of Hoobler have been confirmed by other investigators in this field.

Anorexia resulting from vitamin B_1 deficiency is in no wise confined to infants and children. Cowgill reported that Newburgh succeeded in increasing the voluntary intake of food in a mentally incompetent woman from 400 to 2,000 calories of food a day by the administration of vitamin B.

There is also a growth factor in vitamin B which should be of interest to the members of this society, particularly those who are practicing general medicine. Morgan and Barry have shown conclusively that a diet deficient in vitamin B is a factor in limiting the growth of American school children. Ross and Summerfeldt corroborated this work by making a carefully controlled study of three groups of from twenty to twenty-three children in each. They found that upon the addition of the vitamin B complex to a good diet the increase in weight of these children was 1.6 times that of the normal expected weight over a period of six months.

In the order of their frequency the neuritides should receive some consideration as a vitamin B_1 deficiency disease. Every physician at one time or another has had an experience with alcoholic polyneuritis. Every report which I have reviewed in the medical literature indicates that polyneuritis observed in alcoholics is due to vitamin B deficiency which is produced by a lowered intake of food, because of poor appetite and by faulty absorption due to the presence of excessive amounts of alcohol and not to

the toxic action of alcohol on the peripheral nerves. At any rate, it can be cured by the administration of vitamin B_1 even though the amount of alcohol consumed is increased.

Strauss, Minot, and Cobb at the Harvard Medical School studied a series of fifty-seven cases of undoubted alcoholic polyneuritis. They were impressed by the striking similarity of alcoholic polyneuritis and the polyneuritis observed in beri-beri. The food intake in alcoholic polyneuritis as in beri-beri is rarely ever adequate. Moreover, in a large majority of instances the food consumption has been inadequate for a number of years. There results a general hypo-glandular function of the body and a great number of the sequelae which follow these disorders.

Occasionally obstetricians observe polyneuritis during pregnancy. According to the observation of Strauss and McDonald they believe that polyneuritis of pregnancy is a vitamin B_1 deficiency. They advance the following reasons for their belief:

1. The polyneuritis of pregnancy is preceded for many weeks by severe vomiting which prevents the ingestion and absorption of food.
2. Diminished gastric function frequently accompanies pregnancy.
3. Excessive demands of fœtus on maternal organism for vitamin B.
4. Clinically and pathologically it resembles polyneuritis of beri-beri and alcoholism.
5. Its incidence is higher where beri-beri is common. Similar observations have been made by other investigators in divergent sections of the country.

Probably the most comprehensive report on polyneuritis of various sorts was that of Voohous, Williams, and Waterman. They reported that they obtained a "gratifying response" in the treatment of polyneuritis in general by the administration of vitamin B_1.

Little will be said about beri-beri, the most classical of all vitamin B deficiency diseases except to mention briefly the cardiac manifestations of the syndrome which have given rise to the term "beri-beri heart". Weiss and Wilkins concluded recently that of the vitamins, vitamin B_1 deficiency was the most important cause of cardiovascular disturbances. These observers state that cardiovascular as well as neurological manifestations are of regular occurrence, and from their observation the most common cardiovascular symptoms are dyspnea with palpitation, tachycardia and embryocardia.

The scope of this paper will not permit a complete discussion of vitamin B_2 or the G complex, but it will be interesting to mention the work of Aykroyd and Kirshman on the treatment of stomatitis in malnourished children. This is a condition developing in malnourished children similar in every respect according to their observation to the "stomatitis observed in pellagra" though it was not accompanied by other signs characteristic of pellagra such as diarrhea, and dermatitis. They administered autoclaved yeast to these children and concluded that the factor which cured the stomatitis was identical to the pellagra preventive factor.

One might also mention the work of Sure and Thatcher in the production of gastric ulcers in the albino rat by feeding it a vitamin B deficient diet. As a result of this work it has been suggested that vitamin B deficiency in the human being may play an important etiological role in the production of peptic ulcer. It is, therefore, felt that gastro-enterologists would do well to bear this fact in mind in treating patients who have peptic ulcers. Some concentrated form of vitamin B could be easily administered.

I have been unable to find anywhere in the literature a specific reference to the so-called "aphthous ulcers" of the mucous membranes of the mouth. The nearest approach to this subject was the observation of Aykroyd and Kirshman of stomatitis developing in malnourished children in India. I studied the description of their cases carefully and I was unable to find any mention of "aphthous ulcers". I do not have in mind those people who may have an aphthous ulcer once in a lifetime. On the other hand, we are seeing people frequently who give a history of having had a great many aphthous ulcers from time to time.

I have a very definite recollection of having been taught that trauma was the etiological basis of aphthous ulcers of the mucous membranes of the mouth and that occasionally there might be a superimposed infection. The accepted type of treatment as taught in those days was cauterization of these ulcers with a weak solution of silver nitrate.

During the past few years, I have seen a great many cases of aphthous ulcers of the mouth. They more commonly occur in the floor of the mouth, beneath or on the margins of the tongue. Less frequently they are seen in the roof of the mouth and on the buccal mucous membranes. As mentioned

above, Sure and Thatcher were able to produce gastric ulcers in albino rats by feeding them a diet which was deficient in vitamin B. The body reserve of vitamin B is a variable factor in different individuals, and I am inclined to believe that those people who have these ulcers have a faulty mechanism of some sort operating in their bodies. Either any one of, or several factors must be coming into play, in that the body reserve of vitamin B may be low in these people, the absorption faulty, or its proper utilization may be interfered with in some way. At any rate, I have been convinced, from clinical observation, that upon the administration of brewers' yeast these ulcers disappear.

I have several patients who heretofore have not been able to obtain relief from any sort of treatment, but by taking yeast at irregular intervals they have been free of ulcers for a longer period of time than ever before. I am not certain what factor of vitamin B it is, but I feel definitely certain that it is a vitamin B deficiency state.

SUMMARY

1. The body reserve supply of vitamin B is a variable factor in different individuals.

2. There are certain factors to be considered in the development of a deficiency state:

1. Supply
2. Absorption
3. Utilization.

3. A few proven vitamin B deficiency conditions are discussed:

A.—B_1

1. Anorexia
2. The growth factor of vitamin B_1
3. The neuritides
4. Beri-beri.

B.—B_2

1. Stomatitis
2. Gastric ulcers in albino rats.

4. Aphthous ulcers are considered a vitamin B deficiency disease.

BIBLIOGRAPHY

Rhoads, C. P., and Miller, D. K.: Hepatic Dysfunction in Dogs Fed Diets Causative of Black Tongue. *Jour. Exp. Med.*, Vol. 67: 463-467, March, 1938.

Day, Paul L., Darby, William J., and Cosgrove, K. W.: The Arrest of Nutritional Cataract by the Use of Riboflavin. *Jour. Nut.*, Vol. 15: 83-90, January, 1938.

Sure, Barnett, Ph. D., and Thatcher, Harvey, S.: Production of Gastric Ulcers in Albino Rats as a Result of Specific Influence of Deficiency of Vitamin B. *Arch. of Path.*, Vol. 16: 809-816, December, 1933.

Marat, Joseph K., and Loef, John A.: Effects of a Vitamin B_1 Concentrate. *Arch. Int. Med.*, Vol. 60: 449-453, September, 1937.

Aykroyd, W. R., and Kirshman, B. G.: The Treatment of Stomatitis Caused by Diet Deficiency. *Ind. Med.*, Vol. 25: 643-646, January, 1938.

Sclare, I. M., L. R. C. P. and S. Ed.: Hypo-Adrenalism and Pellagra, The Role of Vitamin Deficiency. *British Med. Jour.*, Vol. 1: 1249-1251, January 19, 1937.

Dalldorf, Gilbert, and Kellogg, Minerva: Incidence of Gastric Ulcers in Albino Rats Fed Diets Deficient in Vitamin B (B_1). *Jour. Exp. Med.*, Vol. 56: 391-398, September, 1932.

Weiss, Soma; Haynes, Florence W., Ph. D.; and Zoll, Paul M.: Electrocardiographic Manifestations and the Cardiac Effect of Drugs in Vitamin B_1 Deficiency in Rats. *Amer. Heart Jour.*, Vol. 15: 206-220, February, 1938.

Cowgill, George R., Ph. D.: The Physiology of Vitamin B_1. *J. A. M. A.*, Vol. 110: 805-812, March 12, 1938.

Strauss, Maurice: Therapeutic Use of Vitamin B_1 in Polyneuritis and Cardiovascular Conditions. *J. A. M. A.* Vol. 110: 953-956, March 26, 1938.

Hoobler, Raymond: The Use of Vitamin B in Diets of Infants. *J. A. M. A.*, Vol. 96: 675-677, February 28, 1931.

DISCUSSION

DR. T. NEILL BARNETT, Richmond: Absorption from the intestine is dependent on the activity and pumping movements of the villi in the mucosa of the bowel. Meissner's plexus has recently been found to be the regulator of villous movements and is stimulated directly by mechanical stimuli and reflexly by local chemical stimuli in the villous epithelium. "In recent experiments (by Mathieu, Veizar, and McDougall) it was found that vitamins B_1 and B_2, when applied locally or intravenously, had no action on the villous movements. However, "Bios", the substance which increases yeast growth (from Dr. O'Brien of Oxford) a concentrated impure dark fluid with an intense smell of yeast extract when applied locally, gave an enormous villous activity". This is of interest from the question of the value of this vitamin in nutrition, and serves as an explanation of the superior results obtained in the use of the liquid vitamin B extract from a nutritional adjuvant. Impure yeast preparations are probably of more value than refined preparations of pure vitamin B.

Vitamin B deficiency is more prevalent than it is generally thought to be, especially if the early mild cases are taken into consideration. If these mild cases were recognized early by such symptoms as anorexia, mental and physical fatigue, altered bowel function, eructation, etc., in the absence of organic disease, the advanced cases that anyone can recognize would seldom be encountered. It is not difficult to understand the prevalence of B avitaminosis, if we remember that this vitamin has to be constantly replenished, as vitamin B is not stored up in the body as a reserve.

Vitamin B has the ability to restore or regulate the tone of the intestinal musculature to a normal state, as is evidenced by the beneficial results of its use in the functional types of constipation, such as the redundant sigmoid and the irritable bowel. Excluding organic involvement, constipation is the result of deficiencies—chiefly vitamin B and the hypothyroid state. Many sufferers can be adjusted by making up these deficiencies. Even the enigma of the spastic colon oftentimes yields to the judicious use of vitamin B given over a long period of time.

The observation by the essayist of the "aphthous" ulcer of the mouth is timely and I believe well founded. I can remember some five or six cases in my practice, all of which were constipated to the extreme degree, who with the use of vitamin B extract (liquid) were relieved of their constipation and also their ulcers. One of them observed that she had not had any ulcer since her constipation was relieved. Her constipation was treated with vitamin B. The tongue lesions and aphthous ulcers are mucous membrane manifestations of vitamin B deficiency and are analogous to skin lesions as found in the same condition.

Early low grade vitamin B deficiency may be the etiological factor in many indefinite digestive disturbances that are now poorly understood.

DR. WILLIAM B. PORTER, Richmond: I should like the essayist to clarify for me in his discussion whether he is referring to B_1 or some other component of the B vitamin fraction. Our impression is that aphthous ulcers, or the other oral lesions observed in pellagra, are not related to B_1. We think, however, that they are definitely related to B_2, or G. Pellagrous patients have at times oral lesions which are quite similar to the so-called aphthous ulcers, and these lesions respond dramatically to nicotinic acid given in adequate doses. Our experience with nicotinic acid shows that the oral lesions disappear within a few days after the drug has been started; however, the administration of B_1 has not modified these lesions in any respect. It is our feeling, therefore, that the mouth lesions observed in various nutritional deficiency states are related not to a deficiency of B_1, but to a deficiency of vitamin G.

DR. JAMES B. STONE, Richmond: In these fretful, hypertonic children, in whom there is no question of allergy or grossly improper feeding, we find that they are sometimes suffering from a vitamin B deficiency, and they are helped by the administration of some form of yeast extract or other concentrated preparations of vitamin B. In the case of older children, also, there is no question that some of them are suffering partly from vitamin B deficiency when they are not thriving.

There is one point I want to bring out which Dr. Hite has not mentioned but which I think he would have if there had been more time. That is, the method of supplying these vitamins. Due to the high-powered advertising that is going on there is a tendency on the part of a good many parents to go to the drug store and buy all sorts of vitamin tablets and extracts for children and pay little or no attention to the diet. If the diet is adequate it will usually supply the B vitamins. We do not know whether we can get an over-dosage or not from these concentrates. It is well to keep in mind that if the diet is properly balanced, containing a liberal quantity of fresh vegetables, citrus fruits, and lean meat and eggs, it will probably furnish an adequate supply of vitamin B. I mention this fact because so many lay people are inclined to over-emphasize the value of vitamin B in bottles. If they will get it from the grocery store instead of from the drug store they will be better off.

DR. HITE, in closing discussion: Time did not permit me to finish reading my paper or I would have covered the question which Dr. Porter has raised about the character or the factor of vitamin B involved in curing so-called aphthous ulcers.

We are definitely satisfied that it is not vitamin B_1 but vitamin B_2, or G. The results obtained by administration of vitamin B in cases who have aphthous ulcers must be analogous to the results obtained in the experimental work cited in the paper on gastric ulcers in rats which were cured by the use of auto-claved yeast. I have not used auto-claved yeast in the treatment of aphthous ulcers, but the whole yeast has been used.

I wish to thank the various gentlemen for discussing this paper.

MORTALITY FROM MALARIA IN THE UNITED STATES.*

JOHN BENJAMIN NICHOLS, M.D.,
Advisory Medical Director, Acacia Mutual Life Insurance Company,
Washington, D. C.

Under natural and uncontrolled conditions malaria in the past has been and now is one of the greatest scourges of humanity, especially in tropical regions. There have been and are times and places where it has caused a devastating mortality and a widespread morbidity productive of much physical incapacitation of populations and economic loss, even to the extent of rendering regions practically uninhabitable. Familiar historical instances of its ravages are afforded by the age-old deadliness of the Campagna surrounding the city of Rome, the staggering mortality at the early settlement of Jamestown in Virginia, and its frustration of the construction of the Panama Canal in the early days. From his vast experience with the disease Heiser says: "Among all tropical diseases malaria is supreme. * * * It is the

*Read before the Middle Atlantic Life Insurance Medical Directors' Club, Roanoke, Va., May 6, 1938.

most persistent, the most destructive, the most widespread, and the most difficult of them all to control."

Theoretically malaria can be controlled or eliminated by the eradication of the anopheline mosquitoes which convey the causative parasites to man. The possibilities of this method have been demonstrated, for instance, by its spectacular success in the Panama Canal Zone and in the northern and western sections and the cities of the United States. In many tropical and warm regions, however, great and baffling difficulties are encountered in the effective application of the method, owing to elusive differences in the breeding and living habits of the mosquito vectors in different localities, the great expense involved, and the insistent tendency of the disease to recur upon relaxation of the control activities.

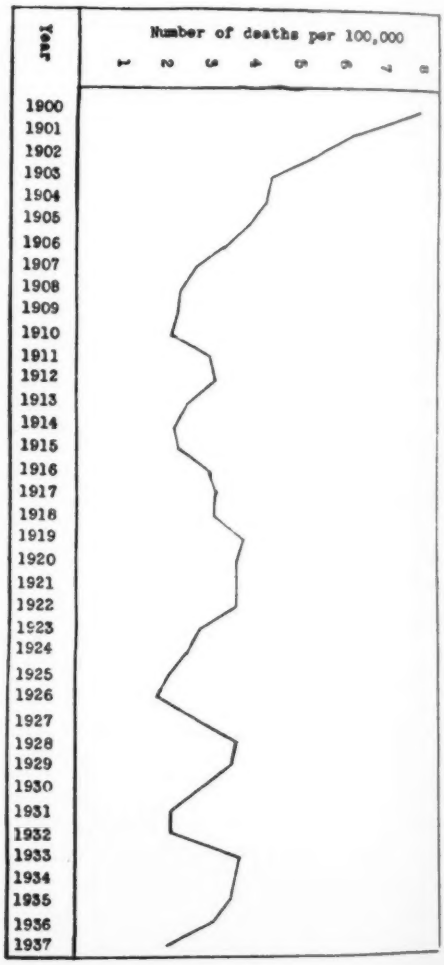
Malaria control measures were instituted in the United States soon after the year 1900, with immediate effect. As a basis for estimating the results obtained, we have the mortality statistics of the United States for 1900. These at that time covered only two-fifths of the population of the entire country, namely, ten entire northern states and about 150 scattered separate cities in other states. Although these statistics are incomplete, the data for the various cities are sufficiently representative of all parts of the country, including the southern sections, to afford some idea of the prevalence and distribution of malaria at that time and serve as a basis for comparison.

In 1900, as always, by far the greatest incidence of malaria was in the southern states; but the disease occurred also to a considerable extent in more or less scattered areas throughout the United States to the northernmost and westernmost parts. The mortality from malaria for the entire registration area in 1900 was 7.9 deaths per 100,000 of population. Five southern cities had extremely high rates, exceeding 100 per 100,000, namely, Wilmington — 262.2, Paducah—257.1, Jacksonville—239.2, Memphis—204.3, and Savannah—169.6. Many other southern cities had rates over 50 per 100,000. Many northern cities and states had considerable mortality from malaria, but very few had rates more than thirty-five.

Due to the introduction of control measures the mortality from malaria declined sharply from the rate of 7.9 per 100,000 in 1900 to 3.9 in 1905, less than one-half; since then it has fluctuated from year to year between 1.9 and 3.8. The annual malaria death rates in the registration area from 1900 to 1937 are exhibited in Table 1 and graphically in the chart.

TABLE 1. ANNUAL DEATH RATES FROM MALARIA IN THE REGISTRATION AREA OF THE UNITED STATES, PER 100,000 OF POPULATION, 1900-1937

Year	Death Rate	Year	Death Rate	Year	Death Rate
1900	7.9	1913	2.5	1926	1.9
1901	6.3	1914	2.2	1927	2.7
1902	5.4	1915	2.3	1928	3.6
1903	4.3	1916	3.0	1929	3.5
1904	4.2	1917	3.2	1930	2.9
1905	3.9	1918	3.1	1931	2.1
1906	3.4	1919	3.8	1932	2.1
1907	2.7	1920	3.6	1933	3.7
1908	2.4	1921	3.6	1934	3.6
1909	2.3	1922	3.6	1935	3.5
1910	2.2	1923	2.8	1936	3.1
1911	3.0	1924	2.5	1937	2.1
1912	3.1	1925	2.1		



It will be seen from the figures and the graph that malaria has fluctuated in cycles of increased incidence alternating with periods of recession. The causes of these periodical fluctuations, well known to malariologists as the "five-year cycles," are not clear. Such cycles of increased mortality occurred in 1911-1912, 1916-1922, 1927-1929, and 1933-1936.

In recent years malarial mortality has been almost entirely eliminated in both the rural and urban areas of the northern and western states, only a very few of which now ever have an annual death rate from the disease exceeding 0.4 per 100,000. Many of these states and large cities may now pass an entire year without a single death from malaria.

In the southern cities also malaria has been quite satisfactorily eliminated. In 1932, for example, the only southern cities over 100,000 in population that had a malaria death rate over two per 100,000 were Memphis (13.9), Houston (4.2), Tampa (3.8), and Dallas (2.2). In the southern states (excluding Texas), taken by themselves, the death rate from malaria in 1930 was 10.2 per 100,000 of population. Of the fourteen southern states, four in the northernmost tier, Kentucky, Missouri, North Carolina, and Virginia, have attained a stable statewide reduction of malaria deaths to below five per 100,000 of population. It is in the rural portions of the farther southern states that much the heaviest malarial incidence and mortality of the country are concentrated. In the years 1933-1934, of all the deaths from malaria in the United States 97 per cent occurred in the southern states; and 78.2 per cent in

TABLE 2. ANNUAL DEATH RATES FROM MALARIA, PER 100,000 OF POPULATION, IN THE SOUTHERN UNITED STATES

STATE	1920	1925	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
United States	3.6	2.1	3.6	3.5	2.9	2.1	2.1	3.7	3.6	3.5	3.1	2.1
Alabama		8.3	11.7	16.8	12.3	8.0	6.7	9.9	10.4	11.4	12.2	7.6
White		6.5	8.0	12.3	8.6	5.3	4.8	8.3				
Colored		11.4	18.1	24.8	18.9	12.8	10.1	12.7				
Arkansas			47.3	36.3	36.1	25.8	24.4	46.4	30.3	28.6	20.1	18.7
White			38.9	29.3	25.1	20.3	19.1	42.1				
Colored			70.9	56.4	67.7	41.7	39.7	58.8				
Florida	34.6	18.8	29.0	33.5	24.1	14.8	16.1	24.6	28.5	20.2	21.0	12.2
White	29.7	14.8	24.4	26.0	18.8	11.7	12.2	19.5				
Colored	44.4	27.4	39.7	51.3	36.8	22.3	25.6	37.0				
Georgia			18.8	23.5	15.1	10.5	10.8	12.6	13.6	12.6	20.0	7.8
White			12.6	18.1	10.2	6.6	7.1	10.3				
Colored			29.1	32.6	23.7	17.2	17.3	16.8				
Kentucky	2.5	1.9	2.2	1.7	2.1	1.8	1.3	3.0	2.2	2.5	1.8	1.3
Louisiana	32.3	13.5	12.0	9.8	8.3	7.0	7.3	19.9	17.1	17.0	11.7	8.4
White	28.3	8.9	9.7	8.6	6.6	5.8	6.8	16.7				
Colored	38.5	21.2	15.9	11.8	11.3	9.1	8.1	25.2				
Mississippi	37.9	23.8	28.0	20.4	17.2	12.4	19.4	39.4	34.3	26.4	18.0	15.4
White	22.1	13.2	19.5	15.6	11.6	9.2	12.9	30.7				
Colored	52.4	33.4	36.3	25.1	22.8	15.6	25.8	48.1				
Missouri	4.0	5.4	4.3	4.3	3.5	4.1	3.2	5.3	4.8	4.2	2.6	2.2
North Carolina	8.1	5.0	2.1	2.0	1.5	1.4	1.6	1.6	1.9	2.7	4.3	2.5
White	4.7	3.4	1.4	1.3	0.8	0.7	0.7	1.3				
Colored	16.1	8.8	3.6	3.9	3.0	3.1	4.0	2.2				
Oklahoma			7.5	6.8	5.9	4.2	4.5	5.4	5.6	5.5	3.7	3.6
White			6.4	6.0	4.9	3.4	3.9	4.8				
Colored			15.7	13.8	14.2	10.5	8.6	10.4				
South Carolina	28.9	10.1	22.1	22.0	21.0	14.5	13.4	14.0	19.4	23.4	23.4	14.1
White	11.8	3.5	9.8	10.7	8.0	5.8	6.4	6.2				
Colored	45.3	16.9	36.2	35.1	36.6	25.0	22.0	23.5				
Tennessee	7.8	6.3	8.3	6.9	5.5	5.5	5.0	10.3	9.5	7.8	5.4	3.6
White	5.5	4.5	6.5	5.2	4.0	3.9	3.8	8.2				
Colored	17.4	14.4	16.3	14.5	12.3	12.3	10.2	19.9				
Texas								7.1	8.2	10.6	8.1	5.8
White								5.8				
Colored								10.6				
Virginia	2.2	1.8	0.5	0.7	0.7	0.5	0.2	0.4	0.4	0.6	0.6	0.4

the rural districts. This shows the distribution of the disease. In the past fifteen or twenty years, aside from the usual cyclic fluctuations, there has been little or no substantial change or improvement in the numbers or rates of the deaths from malaria in these rural regions. This constitutes a very serious public-health situation and problem.

Malaria is not evenly distributed in individual infected states, but has concentrations in particular localities therein, with intervening areas freer of the disease. An apparently low general average malaria mortality rate for a state may create a feeling of deceptive security, since it does not exclude the possibility of an undesirable and a remediable heavy concentration of the disease in a limited section. An annual death rate from malaria of over fifty per 100,000 of population has been regarded as very serious; of fifty to ten as moderate; under ten as inconsiderable. This may apply to the southern states; but any northern or western state with an annual rate over 0.4 would almost certainly contain some notable local concentration of infection requiring attention.

Following the censuses of 1920 and 1930, studies were made by Maxcy and by Dauer and Faust of the distribution of malaria in the south by counties, according to their respective malarial death rates. There was moderate rural malaria mortality throughout the entire Atlantic and Gulf low-lying and fluvial coastal plain regions, along the Mississippi Valley down from southeastern Missouri, and in eastern Texas and Oklahoma. The affected areas were limited in the east by the mountainous and upland regions, and in the west by the arid plains of western Texas and Oklahoma. There were two separate regions of high malaria mortality: one eastern, comprising north-central Florida, across southern Georgia, and up the coast into South Carolina; and the other in the Mississippi Valley from southeastern Missouri to northern Louisiana, with a westward extension into southeastern Oklahoma. The conditions and locations were much the same in both 1920 and 1930, with those of the latter period somewhat better in the western regions and worse in the eastern.

The detailed statistics for the southern United States of malaria death rates 1920-1937 are presented in Table 2, and for numbers of deaths from the disease 1930-1937 in Table 3.

The total annual number of deaths from malaria in the United States (see Table 3) has in recent years ranged between three and five thousand. This approximates the numbers of annual deaths from typhoid fever and diphtheria, two other preventable diseases.

TABLE 3. TOTAL NUMBERS OF DEATHS FROM MALARIA IN THE SOUTHERN UNITED STATES, 1930-1937

STATE	1930	1931	1932	1933	1934	1935	1936	1937
Alabama	326	213	179	265	292	327	345	219
Arkansas	670	481	456	869	599	564	411	384
Florida	356	223	246	382	453	331	349	204
Georgia	440	305	315	367	410	387	606	242
Kentucky	54	48	35	79	63	74	52	38
Louisiana	176	149	156	428	363	360	257	180
Mississippi	347	252	395	807	688	518	352	312
Missouri	129	149	116	197	186	164	104	89
North Carolina	47	46	53	51	66	94	155	87
Oklahoma	143	103	109	134	139	102	92	92
South Carolina	366	252	234	244	354	378	423	264
Tennessee	144	144	132	275	265	222	155	105
Texas				429	497	644	497	361
Virginia	16	13	6	10	10	14	17	10
Total for Southern States				4537	4385	4179	3815	2587
All other states	199	157	136	141	135			142
Total for United States				4678	4520	4435	3943	2729
Percentage of malaria deaths of entire country occurring in Southern States				97.0	97.0			94.8

The numbers of deaths in the individual states for 1935-1936 are from the state reports; the other figures are from the United States Census reports.

In the times and places of its heaviest incidence the deaths from malaria in the southern states have ranged as high as one death in every twenty or thirty deaths from all causes; but usually they are less than 2 or 1 per cent. For the United States as a whole, they are about one-third of 1 per cent; for the southern states by themselves about 1 per cent. Originally the death rates from malaria in the cities probably approached or possibly exceeded those in the corresponding rural districts. Latterly, however, in the south the rural rates and actual numbers of deaths from malaria have ranged about seven times those for the cities; in the north, the disease has been eliminated in the rural as well as in the urban districts. The factors productive of malaria are much the same in the cities as in the country, the present differences in the south being due to more effective and extensive antimalarial operations having been carried out in the cities.

Occupation is not in itself alone a specific factor

TABLE 4. TOTAL NUMBERS OF DEATHS FROM MALARIA IN THE UNITED STATES, 1933-1935

	1933	1934	1935
United States, total	4,678	4,520	4,435
Cities of 10,000 or more	627	601	
Cities of 2,500 to 10,000	354	420	
Rural	3,697	3,499	
Percentage of rural deaths	79.0	77.4	
Male	2,521	2,317	2,318
Female	2,157	2,203	2,117
White	2,675	2,493	2,575
Male	1,548	1,325	1,432
Female	1,127	1,168	1,143
Negroes	1,936	1,921	1,848
Male	936	945	878
Female	1,000	976	970
Other Races	67	106	12

in the incidence of malaria. It is only as the occupation involves exposure to the bites of the infective mosquitoes that there is any relation. Thus, farmers and laborers in heavily infected rural regions would be much exposed to the danger of contracting malaria. Economic and environmental conditions are very important factors, since those of low social grade, who from poverty, ignorance, or indifference cannot or do not, in their mode of living and working, take proper precautions against the mosquito vectors, are exceedingly apt to acquire the disease.

The death rate from malaria is much greater in the colored population than in the white. In the individual southern states, in which the conditions are comparable, the colored rates latterly have ranged from one and one-half times to three or four times those of the white. The differences in mortality are probably more the result of environmental and economic conditions than of racial factors.

The mortality of the two sexes from malaria is about equal; however, among negroes it seems to be slightly greater in the females. The rates per 100,000 of population for 1930 were:

	MALE	FEMALE
Total	2.8	2.9
White	1.7	1.5
Negro	14.8	16.3

Age has a very definite relation to mortality from malaria. The rates for 1930 and 1935 are presented in Table 5. These figures are somewhat diluted and lowered, from the fact that the population base is that for the entire country, while the deaths are mainly concentrated in the limited southern sections; however, they sufficiently represent the relative differences for age. The mortality is higher under five

TABLE 5. DEATH RATES FROM MALARIA BY AGE IN THE UNITED STATES, PER 100,000 OF AGE POPULATION, 1930 AND 1935

AGE AT DEATH, YEARS	1930	1935
Under 5	6.4	8.2
5-9	2.1	2.7
10-14	1.4	1.8
15-19	1.1	1.9
20-24	2.0	2.3
25-29	1.5	2.1
30-34	1.7	2.5
35-44	1.7	2.4
45-54	3.1	3.3
55-64	3.9	5.0
65-74	5.7	7.5
Over 74	13.6	15.4

years of age; lowest from ten to nineteen years; rather uniform from twenty to forty-four years; then increasing, to much the highest over sixty-five and seventy-five years of age.

The mortality from malaria naturally varies much with the season of the year and the corresponding abundance of the mosquitoes, as illustrated by Table 6, giving the deaths by months in the United States

TABLE 6. PERCENTAGES OF DEATHS FROM MALARIA BY MONTHS IN THE UNITED STATES, 1933-1934 (COMBINED)

MONTH	PERCENTAGE	MONTH	PERCENTAGE
January	2.7	August	15.2
February	1.6	September	17.7
March	2.1	October	18.7
April	2.8	November	11.5
May	3.5	December	5.1
June	7.5		
July	11:6		100.0

for the two years 1933 and 1934. The deaths are lowest about February, increase rapidly during the summer months, and reach a maximum in September or October.

The eradication of malaria from the Panama Canal Zone, formerly one of the world's worst pestholes, was a maximum achievement of sanitary engineering. In the year 1906, out of every thousand Canal Zone employees there were 821 clinical cases of illness from malaria, and 8.78 deaths (878 per 100,000). These rates gradually—not immediately—diminished, so that since 1915 the cases have ranged from only eleven to thirty-one per thousand per year, and in the fifteen years from 1921 to 1935 there were only six deaths in all from malaria.

In Puerto Rico the mortality from malaria is extremely heavy, in 1932-1934 the deaths having averaged 171 per 100,000 of population, and the pro-

portion of the total deaths due to malaria having been 8 per cent.

In Hawaii there is no mortality from malaria.

Malaria is naturally a cause of concern in the issuance of life insurance in the regions of its heavy incidence. Monitory lists of highly malarious southern counties are maintained by insurance companies in which this factor is given special consideration. The counties of high malaria mortality are, however, constantly varying from year to year, and regions in their vicinity are only slightly less undesirable; so that no sharp delimitation by definite counties is permanently valid. Most of the present heavily infected malarious counties are of low economic grade, usually with a proportion of negro population much higher than the average for their state, in some instances exceeding 70 and even 80 per cent. Such regions are too poor to afford a probable, profitable, or attractive field for insurance exploitation. Most of the malarious counties have a total death rate from all causes among the white residents of their rural portions at the worst not very unfavorable in comparison with the corresponding rates for their state or the entire country. The conditions are far from prohibitive for well selected insurance among the more prosperous and responsible white rural residents, who can be depended on to take proper precautions and keep their houses well screened and their premises properly policed against the propagation and access of the mosquitoes.

From a health and economic standpoint the morbidity caused by malaria, as well as its mortality, is of great public consequence. For every death from malaria there are a large number of non-fatal cases of illness from the disease, the ratio being usually estimated at one death for every 200 or more cases. This was about the ratio in the Panama Canal Zone, among whose employees for a period of thirty years there were a probably reliable number of 100,961 cases of sickness and 683 deaths from malaria,—a case fatality rate of 0.68 per cent. At the rate of 200 cases for every death there would occur each year in the United States more than 800,000 cases of illness from malaria. While many of the cases are brief and mild, in the aggregate they contribute vastly to morbidity and temporarily incapacitating illness in the many affected localities; besides frequently becoming chronic and causing lasting debilitation and invalidism or laying a foundation for the development of other complicating diseases.

In the north malaria was formerly very conspicuous as a cause of illness. The public was very malaria-conscious, and to malaria, or "malarial poisoning" as the term was, was attributed the causation of all sorts of illnesses and ailments. Malaria was rather more looked upon as a general malign influence than as a specific disease; and there was much carelessness of diagnosis and looseness of language concerning it.

Compulsory reporting to the health authorities of cases of sickness from malaria is in force in a number of southern states. Such reports are very incomplete, since aside from the negligence of physicians large numbers of the patients do not call any doctor but treat themselves with quinine upon the onset of chills. Such case reports are useful, however, in helping the health officials to keep track of the intensity and location of prevailing outbreaks.

Another method extensively employed for reliable and ready determination of the prevalence and concentration of malaria in particular localities consists in making blood examinations of the inhabitants of the communities or local population groups, such as school children, to determine the proportion of individuals who knowingly or unknowingly harbor the parasites in their blood. A summary by Williams of 129,000 blood slides examined in 1934 showed an average index or ratio of infection of the populations represented of 5.8 per cent; with a distribution of about 60 per cent benign tertian and 40 per cent estivo-autumnal types of the parasites. In particular localities at times of heavy outbreaks much higher proportions of the populations are found to be infected with malaria, frequently over 20 or 30 per cent, and even as high as 50 to 65 per cent. By means of these malarial surveys points or foci of maximum concentration of the disease can be located, and given primary attention in the antimalarial operations.

Surveying the situation as a whole, there has since 1900 been a decrease of considerably more than one-half in the general malaria mortality of the United States, representing a saving of five to six thousand lives annually and untold economic gain. This reduction has been accomplished (1) in the northern and western states, in both cities and rural areas, where the disease has approached the vanishing point and has become as rare as once it was common, almost a forgotten disease; and (2) in the southern cities, where eradication is more difficult. In rural

sections of the south malaria is still seriously prevalent. Since 1933 very extensive, energetic, and intelligent antimalarial work has been actively prosecuted throughout the south, with the aid of generous Federal emergency relief funds. Laborers have been employed by tens of thousands, thousands of miles of ditches have been dug, hundreds of thousands of acres of land have been drained, and millions of inhabitants have been brought within the influence of the mosquito policing. The prospects of future results from this active attack on the disease should be very hopeful.

The control of malaria through the eradication of the mosquito vectors is expensive and difficult, sometimes baffling. The reduction of the disease in the United States and the Panama Canal Zone, however, shows the possibilities attainable. The results constitute one of the major large-scale achievements of medical and sanitary science, of inestimable benefit to mankind.

REFERENCES

Kenneth F. Maxcy: Public Health Reports—Volume 38, 1923, p. 1125.

C. C. Dauer and Ernest C. Faust: *Southern Medical Journal*—Volume 29, 1936, p. 757.

Louis L. Williams: *American Journal of Public Health*—Volume 25, 1935, p. 11.

Victor Heiser: An American Doctor's Odyssey, 1936, p. 437.

Alfred C. Reed: Medical Section, American Life Convention—Volume 27, 1937, p. 176.

51 Louisiana Avenue.

LYMPHEDEMA OF EXTREMITIES.*

EUGENE L. LOWENBERG, M.D., F.A.C.S.,
Norfolk, Virginia.

The extremities are possessed of a three-fold vascular system, arterial, venous, and lymphatic. Embryologically, the lymphatic system is an outgrowth of the venous, and functionally, the lymphatics act as accessory vascular channels, for the return of tissue fluid, and particularly its protein to the large veins of the neck, and thus to the right side of the heart.

The need for this accessory system arises from the loss of fluid, and of blood protein from the blood capillaries into the tissue spaces. The lymphatic system normally plays an insignificant part in the water balance. However, in pathological processes it becomes all important.

ANATOMY

The lymphatic capillaries and delicate lymphatic vessels of the extremities are closed vessels whose walls, lined only with endothelium are so thin and transparent that the fluid they contain can readily be seen through them. The vessels have a beaded appearance due to many valves and corresponding constrictions throughout their length. In general, there is more lymphatic than blood capillary surface. Lymph capillaries are especially abundant in the skin, forming a rich plexus, freely anastomosing over broad cutaneous surfaces, and emptying into somewhat deeper collecting vessels. The collecting vessels are in two systems, one subcutaneous and one deep. Although an offspring of the veins and in many other respects similar to veins, the two sets of lymphatics, superficial and deep, are not known to have well developed connecting branches.

From the rich plexuses of the skin and less abundant plexuses of the muscles, large lymphatic collecting vessels carry lymph to the proximal nodes in the pelvis and axilla as the case may be, and thence by the thoracic trunk and jugular trunks to the veins of the neck. Lymph flow is normally centripedal, and is maintained by posture and muscular activity. The circulation of lymph varies greatly but is normally very rapid. Many valves normally prevent the downward flow of lymph, just as in the venous system. And like veins, the lymphatics may dilate, become varicose, establish collateral circulation, become inflamed, thrombosed, or become obstructed. The convergence of all extremity lymphatics into the same trunks in the pelvis or axilla enables obstruction to occur readily at these sites.

When the lymphatics fail in their function of absorbing excess fluid protein from the tissue spaces, lymphedema results. Normal tissue fluid protein content is about 1 per cent, whereas in lymphedema the protein content may be as high as three or 4 per cent[1].

*From the Peripheral Vascular Clinic of Norfolk General Hospital.

Read at a meeting of the Norfolk County Medical Society.

The rich protein content of the tissue fluid of lymphedema stimulates a rapid growth of fibroblastic tissue and renders the extremity extremely susceptible to streptococcal lymphangitis. The resultant fibrosis and recurrent attacks of infection establish the characteristic vicious cycle of these cases—lymph stasis, tissue fibrosis, lymphangitis, with increased lymphatic obstruction from thrombosis, and aggravated lymph stasis.

The composition of lymph is similar to that of blood capillaries. It contains protein, fibrinogen, prothrombin, chlorides, calcium, nitrogen, urea creatinine, sugar, amino acids, phosphorus, red and white corpuscles.

The blood capillaries are the essential mechanism for determining the water content of the tissues. Water passes out of the blood capillaries as a result of capillary pressure, and passes in as a result of the osmotic pressure of the blood proteins. (Stalling). This balance of forces between the capillary blood pressure and the osmotic pressure of the blood plasma proteins maintains normally a minimum amount of fluid in the tissue spaces.

From the foregoing, it is apparent that any factors that elevate capillary pressure, lower colloid osmotic pressure, damage capillary walls, dilate or obstruct the lymphatics, will favor edema. The following table is modified from Landis:

FACTORS IN THE PATHOGENESIS OF EDEMA—LANDIS

FACTORS FAVORING EDEMA FORMATION	CLINICAL EXAMPLES
A. Primary	
1. Elevated capillary pressure	1. (a) Varicose veins, external pressure on veins (b) Thrombophlebitis, superficial (c) Thrombophlebitis, deep (Phlegmasia Alba Dolens) (d) Cardiac edema with venous congestion
2. Lowered colloid osmotic pressure	2. (a) Nutritional (hypoprotein) edema (b) Nephritic edema (c) Cardiac edema, late stages with malnutrition
3. Damage to capillary wall	3. (a) Inflammatory edema (b) Nephritic edema (c) Cardiac edema (chronic anoxemia) (d) Peripheral arteriosclerosis or occlusion (anoxemia)
4. Lymphatic obstruction	4. (a) Lymphedema due to malignant occlusion, surgical removal of lymph nodes, lymphangitis with lymphatic thrombosis, etc. (b) Lymphedema of Phlegmasia Alba Dolens
5. Lymphangiectasis	5. (a) Congenital lymphedema (b) Valvular incompetence following lymphangitis (c) Heat of tropics
B. Contributory	
6. Low tissue pressure	6. (a) Edema of periorbital tissues and genitalia
7. High tissue fluid colloid pressure	7. (a) Elephantiasis nostros
8. High salt intake	8. (a) Increases edema if water is available
9. High fluid intake	9. (a) Increases edema if salt is available
10. Warm environment	10. (a) Heat edema (b) Increases all types of edema
11. Disturbed innervation	11. (a) Tropho-edema as after subarachnoid alcohol block (b) Unilateral edema in hemiplegia (c) Angioneurotic edema
12. Endocrine imbalance	12. (a) Myxedema (b) Menstrual edema

Clinical edema is usually not the result of one but of several of these factors. Thus, in cardiac edema there are elevated capillary pressure from venous stasis, lowered osmotic plasma pressure from malnutrition, and damage to the capillary wall from anoxemia. Likewise, in the edema of superficial thrombophlebitis, there are elevated capillary pressure from venous thrombosis, damage to capillary walls from inflammation and thrombosis, and lymphatic obstruction from perivenous inflammation.

The principal clinical varieties of edema of the extremities, exclusive of lymphedema, are as follows:

Cardiac edema
Nephritic edema
Nephrotic edema
Cirrhosis of liver
Edema from thrombophlebitis, varicose veins, and external pressure on veins
Inflammatory edema
Nutritional edema

Edema of peripheral arteriosclerosis with arterial occlusion
Tropho-edema
Myxedema
Menstrual edema
Angioneurotic edema

DIFFERENTIAL DIAGNOSIS OF LYMPHEDEMA FROM OTHER TYPES OF EDEMA

The brawny indurated skin and the hypertrophied limb of advanced lymphedema are characteristic and rarely present a diagnostic problem. Early or slight lymphedema, especially when bilateral, may be with difficulty differentiated from the edema of the systemic or local diseases just enumerated. A careful history and physical examination will usually clarify the situation. Heart and kidney disease are diagnosed by the usual means. Nutritional and nephrotic edema require total plasma protein, and albumin-globulin ratio estimations; myxedema presents a characteristic picture confirmed by the basal metabolic determination. Menstrual edema is cyclical and accompanied by a premenstrual reduction in the urinary output; angioneurotic edema is intermittent in occurrence and patchy in distribution and the edema does not diminish when the extremity is elevated. Tropho-edema is readily overlooked unless a careful neurological examination is made.

Not all extremity swelling is edema. Lipodystrophy is usually associated with generalized obesity or obesity about the pelvis. The swelling is invariably bilateral, pitting on pressure is much less evident than in lymphedema, and there is less marked diminution in size following elevation of the extremities. Sarcoma, lipomas of the soft parts, neoplasms of the bone may cause unilateral swelling, which, however, is usually more localized than lymphedema, and which casts a characteristic shadow by X-ray.

LYMPHEDEMA

Lymph is fluid obtained from lymph vessels in contradistinction to the tissue fluid of the intercellular spaces and the plasma of the blood. Lymphedema is a swelling of the soft tissues which is the result of increased lymph within the dilated or obstructed lymphatics or endothelial lined lymph spaces. There is an associated increase in tissue fluid.

Lymphedema may be produced by obstruction of the lymphatics centrally, destruction by thrombosis or strangulating fibrosis locally, or by congenital lymphangiectasis. The mechanism of production of a given case of lymphedema is often obscure and for the present, classification of lymphedema is on a purely clinical basis. The following table is Allen's:

CLASSIFICATION OF 300 CASES OF LYMPHEDEMA—ALLEN[2]

A. NON-INFLAMMATORY	
I. PRIMARY	
Praecox	93
Congenital	
1. Simple	12
2. Familial (Milroy's disease)	0
II. SECONDARY	
Malignant	32
Surgical removal of lymph nodes	61
Pressure	1
Roentgen and radium therapy	3
B. INFLAMMATORY	
I. PRIMARY (single or recurrent acute and chronic)	41
II. SECONDARY (single or recurrent acute and chronic)	
Venous stasis	13
Trichophytosis	5
Systemic disease	5
Local tissue injury or inflammation	34
Filariasis	0

Most cases of lymphedema may be classified without difficulty according to this tabulation. "Milk Leg" should probably be given a place as a secondary inflammatory lymphedema, as is discussed later in this paper. It is to be noted that in Allen's series, lymphedema praecox accounted for the greatest percentage of non-inflammatory primary lymphedemas, and malignant occlusion or surgical removal of

MY OWN MUCH SMALLER SERIES IS TABULATED AS FOLLOWS:

A. NON-INFLAMMATORY	
I. PRIMARY	
Praecox	6
Congenital	
1. Simple	2
2. Familial (Milroy's disease)	0
II. SECONDARY	
Malignant occlusion	4
Surgical removal of lymph nodes	2
Pressure	0
Roentgen and radium therapy	0
B. INFLAMMATORY	
I. PRIMARY (single or recurrent acute and chronic)	27
II. SECONDARY (single or recurrent acute and chronic)	
Venous stasis	14
Trichophytosis	4
Systemic disease	1
Local tissue injury or inflammation	6
Filariasis	0
	66

lymphnodes accounted for the majority of non-inflammatory lymphedemas of secondary nature. In inflammatory lymphedema, the cause is so often obscure that the majority of cases have to be classified as primary.

The non-inflammatory lymphedemas have certain features in common. The edema is ordinarily symmetrical, beginning at the foot or hand and extending partly or entirely to the groin or axilla. The skin of the part is smooth and not discolored. There are no pigmentations, eczema or ulceration. There is pitting readily on pressure. The edema is worse during long periods of activity, and practically disappears on elevation of the extremity. As the swelling becomes more marked and its duration increases, the smooth skin becomes roughened, and the hitherto soft edema becomes resistant to pressure. Elevation now causes a reduction but not a disappearance of the swelling. Actual tissue hypertrophy begins to develop and the limb becomes grossly disfigured and uncomfortable. Attacks of acute lymphangitis and cellulitis, typical of all cases of advanced lymphedema, occur but with far less frequency than in the inflammatory lymphedemas.

LYMPHEDEMA PRAECOX

This is an original term of Allen's and is used to denote early development of primary non-inflammatory lymphedema. In the majority of cases the onset is between ten and twenty-four years of age, while in many instances it begins at puberty. The condition affects predominantly females. One or both lower extremities may be affected. The edema ordinarily progresses up the leg slowly and the entire limb becomes edematous over a period of months or years. The edema is worse during menstruation and in warm weather ,and when the patient is on her feet a long while. Elevation of the extremity produces its temporary disappearance. The young girls who become afflicted with lymphedema praecox are often greatly distressed by the appearance of their swollen extremity and constantly seek advice, which unfortunately is rarely of benefit.

I have seen to my knowledge six cases of this type, two before I was familiar with Allen's description and four since. The last patient was a Miss C., age twenty-two, who could only state that several months previously her right leg began to swell about the ankle and this condition gradually progressed up to the thigh. The entire history was that of conversion of a normal limb into a swollen one; nothing else was noteworthy although the patient did menstruate irregularly. The edema was greater during menstruation.

The cause of lymphedema praecox is unknown. Presumably the extremity lymphatics are dilated. Whether or not this dilatation is secondary to obstruction of the main lymphatic channels in or above the pelvis is unknown. Homans, Drinker and Field report a case in which, at exploration, greatly enlarged lymph vessels were found in the pelvis, suggesting obstruction proximally. The most likely error is to mistake lymphedema praecox for the chronic edema that often follows milk leg. The characteristic age of onset and the absence of a history of acute deep femoral thrombophlebitis in the former are the distinguishing features.

CONGENITAL EDEMA

Lymphedematous swelling present at birth is called congenital lymphedema and, when the condition is familial, it is known as Milroy's disease. The clinical characteristics of congenital lymphedema are

Fig. 1.—Lipodystrophy. There are a number of medium-sized varicosities, but the leg size is due to lipodystrophy.

the presence at birth of a diffuse swelling involving part or all of a single extremity, the disproportionate increase in size of the involved extremity as contrasted with the uninvolved companion member; the absence of pain, ulcers, and rarity of recurrent at-

tacks of infection, and the otherwise good health of the patients. The swelling is firm but pits on pressure, and it is reduced markedly in size when the extremity is elevated. The pathology of congenital lymphedema is presumed to be a congenital malformation in which widely dilated lymph spaces and connective tissue replace the space ordinarily taken up by subcutaneous tissue—a lymphangiectasis and tissue fibrosis. The microscopic picture is entirely characteristic. Congenital lymphedema has to be differentiated from lipodystrophy and congenital arteriovenous fistulas. In the latter, there is an increase in length as well as girth of the extremity, the temperature of the skin is higher than that of the companion member, the superficial veins are dilated and contain blood which resembles arterial blood as to oxygen content.

SECONDARY NON-INFLAMMATORY LYMPHEDEMA

In addition to the primary lymphedemas, praecox and congenital, lymphedema of a non-inflammatory type may occur secondarily to known causes of lymphatic obstruction—malignant occlusion, surgical removal of lymph nodes, pressure, roentgen and radium therapy. As malignant occlusion by metastasis of malignant disease of the breast, uterine cervix, uterus, vulva, prostate gland, bladder, testes accounts for a large percentage of secondary non-inflammatory lymphedemas, the possibility of malignancy must be ever borne in mind.

INFLAMMATORY LYMPHEDEMA

All cases of inflammatory lymphedema have one feature in common, single or recurrent attacks of acute cellulitis and lymphangitis—attacks of lymphangitis streptogenes. The contrast between lymphedema of inflammatory origin and the congenital or praecox or other types of non-inflammatory lymphedemas is striking. In inflammatory lymphedema, progression is by a series of erysipelas-like attacks which are sudden in onset, and striking in severity; in non-inflammatory lymphedema the history is one of slowly progressive edema. Only occasionally does inflammatory lymphedema develop without these typical attacks of lymphangitis and cellulitis, and in these instances there has probably existed a subclinical infection following an unnoticed injury or infection. The extremity affected with inflammatory lymphedema is often warmer than its companion member; reddish discolored areas are present in the skin; eczema, ulceration are common. In non-inflammatory lymphedema, the extremity lymphatics are dilated, due to congenital lymphangiectasis or obstruction proximally; in inflammatory lymphedema the extremity lymphatics are thrombosed or destroyed locally by attacks of lymphangitis.

When inflammatory lymphedema exists without apparent cause, it is classified as primary inflammatory lymphedema. Probably infection has entered through unnoticed portals of entry. McMaster and Hudack, working with intracutaneous vital dye injections, have demonstrated that foreign matter capable of initiating infection may enter open lymphatics, following a miscroscopic abrasion of the most superficial strata of skin.[3]

Fig. 2.—Primary inflammatory lymphedema. An acute attack of cellulitis and lymphangitis subsided under sulfanilamide therapy, but the lymphedema persisted.

Most cases of inflammatory lymphedema are secondary to detectable cause, such as contusions, laceration, surgical incisions, vesicles, abscesses, bubo, furuncles, burns, fractures, penetrating wounds, dog bites. In each instance, the injury or infection has initiated one or more attacks of acute cellulitis and lymphangitis characteristic of this type of lymphedema. Single attacks each leave the extremity more edematous, with more lymph stasis, more tendency to fibrosis, greater susceptibility to further attacks of lymphangitis.

A special type of inflammatory lymphedema oc-

Fig. 3.—Traumatic lymphedema. Lymphedema developed subsequent to striking the leg violently against a chair.

curs in connection with trichophytosis of the toes. Attacks of acute erysipelas-like inflammation of the skin occur, resembling the acute attacks of lymphangitis and cellulitis typical of inflammatory lymphedema. On the feet or hands or between the toes or fingers are usually to be seen open lesions of trichophytosis. Considerable disagreement exists as to whether the attacks of lymphangitis and cellulitis in these cases are due to the trichophytes themselves, are secondary to invasion of the streptococci, or are allergic manifestation of the trichophytes or of streptococci. Sulzberger and others claim that the attacks are allergic manifestations of the trichophytes and claim to prevent the attacks by desensitization to the fungus organism.[4] Most of my cases secondary to epidermophytosis of the toes have appeared to be definitely streptococcal, as indicated by their almost specific response to streptococcus antisera. Dr. Whitehill, my associate, is however, at present desensitizing a patient who has been having recurrent attacks of lymphangitis and cellulitis for over fifteen years, who has chronic epidermophytosis and who gives a positive intra-dermal test to trichophyton extract 1:30 dilution.

Fig. 4.—Acute cellulitis and lymphangitis complicating epidermophytosis of the toes. Sulfanilamide caused a rapid subsidence of acute symptoms.

Other causes of inflammatory lymphedema are venous stasis from varicose veins, pregnancy, influenza, typhoid fever, pneumonia, malaria. In most instances, lymphedema in such cases is due to associated thrombophlebitis. Filarial infestation also causes inflammatory lymphedema and as filaria is known to exist in the South, we have to be on the watch for it in this locality. The diagnosis depends on finding the filarial organism in blood drawn from the patient at night during an attack of acute lymphangitis and cellulitis.

ELEPHANTIASIS

Lymphedema, non-inflammatory or inflammatory, that progresses to an advanced stage is called elephantiasis. In a small proportion of advanced non-inflammatory lymphedema and in most instances of inflammatory lymphedemas recurrent erysipelas-like attacks of acute lymphangitis and cellulitis occur which greatly increase tissue fibrosis, induration, and skin hypertrophy, a clinical condition called "elephantiasis nostras streptogenes". In non-inflammatory lymphedema, the lymphatic stasis *per se* with its consequent fibroblastic proliferation is sufficient to produce elephantiasis in the absence of infection; infection simply aggravates the process. In elephantiasis from inflammatory lymphedema, enlargement cannot develop without the infectious attacks. In the last stages of non-inflammatory elephantiasis the limb is grossly large and deformed; in inflammatory elephantiasis often contracted, particularly about the ankle.

Elephantiasis nostras streptogenes is then a chronic inflammatory fibromatosis of the dermal and hyperdermal tissues, either preceded or accompanied by lymphatic stasis, and repeated attacks of streptococcus lymphangitis.[5] There is ample though not positive evidence of the role of the streptococci in these cases. Clinically the typical acute attacks of lymphangitis and cellulitis resemble erysipelas. Coincident with the development of a small reddened area on the extremity, the patient becomes generally sick with chills and high fever. The reddened area spreads until a considerable portion of the extremity is swollen and tender and the skin of the involved part raised, red and hot. The proximal lymph nodes swell and become tender. High fever, severe systemic reaction persist for several days after which the condition usually subsides spontaneously, never spreading beyond the limb and never suppurating. After all clinical signs of acute inflammation have disappeared, swelling is present in a greater degree than before the attack, and the already disordered lymphatics are even more extensively thrombosed and obstructed by fibrosis. The swollen leg is indurated, its cutaneous surface discolored and pig-skin in appearance. Ulceration, difficult to heal, occurs from the slightest injury.

Microorganisms have not been found with uniformity in the tissue or edema fluid secured during the erysipeloid attacks of chills and fever of elephantiasis streptogenes, and blood cultures are invariably negative. However, in experimental lymphedema in the dog, the streptococcus can be repeatedly isolated early in the acute attack.[6] Spontaneous attacks of streptococcus infection occur in experimental elephantiasis and attacks can be produced at will by injecting comparatively few organisms into the region of lymphedema. These facts are especially significant in view of the fact that it is practically impossible to infect non-edematous dogs by the subcutaneous injection of streptococci. Streptococcus antiserum and recently sulfanilamide have been reported as aborting attacks in humans.

The microscopic picture of elephantiasis is typical. There is marked hypertrophy of the skin and subcutaneous tissue with an increase in the collogen bundles. The deep fascia is very thickened. The vessel walls are hypertrophied and show perivascular round cell infiltration. In the lymph soaked tissue, almost no evidence of lymphatic vessels exists. Interesting from the standpoint of treatment, all of the pathology

Fig. 5.—Elephantiasis subsequent to iliac thrombophlebitis (Milk Leg). Note contraction above the ankle.

is in, or superficial to, the deep fascia. The replacement fibrosis of the subcutaneous tissue presents a characteristic trabeculated appearance in the soft tissue roentgenograms which are considered diagnostic by Reichert.[7]

The experimental reproduction of elephantiasis

Fig. 6.—Elephantiasis.

has been recently accomplished by Drinker by repeated intralymphatic injections of a suspension of firmly divided crystalline silica in 2.5 per cent quinine hydrochloride.[8] The lymphatics are first made visible by injecting a suitable dye between the toes. The lymphatic vessels are needled with the aid of a dissecting loupe and cannulated with a fine quartz needle. Injections are made into the popliteal lymph node and deep lymphatics of the thigh, and in the superficial lymphatics of the lower leg. The successive deposition of silica and the sclerosing effect of quinine bring about a sterile and painless destruction of lymphatics and lymphedema and elephantiasis result. Attacks of chills, fever, cutaneous erysipeloid inflammation, similar to those in human elephantiasis, occur spontaneously. When thoratrast is injected into the lymph choked tissue of experimental elephantiasis, the suspension drifts into widely distributed tissue spaces close to the surface, a valveless series of lymph pools.

DIFFERENTIAL DIAGNOSIS OF EXTREMITY SWELLING

The factors in the pathogenesis of edema have been mentioned, the causes of extremity swelling not of lymphatic origin have been given, the various clinical varieties of lymphedema have been described, and an advanced form of lymphedema, elephantiasis, discussed. Although the subject seems somewhat confusing, as a matter of fact it is not difficult to classify a given case of extremity swelling. The usual history and general physical examination should diagnose the two chief systemic causes of non-lymphedematous swelling, cardiac or nephritic disease. Such edema, dropsy edema, exists throughout all the structures of the body, especially in the subcutaneous tissue and muscle, and does not particularly involve the skin. The skin is tense, not thickened, smooth, pits readily on pressure. True lymphedema involves the skin and subcutaneous tissues of the extremity only and not the deeper tissue. It produces a brawny leathery condition of the skin which pits much less definitely than cardiovascular edema. In lymphedema, the edema fluid is rich in protein content, 2 to 4 per cent, while in dropsy, the protein content approaches normal. Of course, the rarer systemic conditions, such as nutritional edema or other conditions listed previously must be borne in mind, but, in general, with cardio-renal disease excluded and no local condition such as thrombophlebitis present, one is dealing with lymphedema, and when the swelling has existed since birth or developed spontaneously in early adult life in the female, we have non-inflammatory lymphedema of congenital or praecox type. The non-inflammatory secondary lymphedema will not be missed if malignancy is kept in mind or some other less serious detectable cause for non-inflammatory obstruction of the proximal lymphatics. The extremity in inflammatory lymphedema has a characteristic discolored and indurated appearance. In the history, there is the one distinguishing feature of all cases of inflammatory lymphedema—single or recurrent attacks of acute lymphangitis and cellulitis.

The lymphedema problem is at present stimulating considerable experimental methods for research. Principal among these methods are the intralymphatic injections of silicon and of quinine in the experimental production of elephantiasis as described by Drinker; the X-ray visualization of lymphatics after the injection of opaque substances such as mercury or thoratrast as exemplified by the work of Zolotukhin[9] in Russia, and Menville[10] in this country, and intracutaneous injection of vital dyes after the method of McMaster of the Rockefeller Institute.

Space does not permit a lengthy description of this latter method but it bids fair to being a practical clinical method of easily studying at least the cutaneous lymphatics. I recently visited Dr. McMaster and he informed me that the New York Post Graduate and the Medical Center are now using the method. It consists of the intradermal injection of an 11 per cent isotonic Locke solution of a highly diffusible dye, patent blue V. With the aid of a binocular microscope, the dye is seen to enter the rich cutaneous network of lymphatics and within a few minutes to appear as colored streamers in the deep lymphatic channels of the skin. The rapidity with which the dye is taken up by the lymphatics and the length and size of the streamers are taken as measures of the lymphatic activity. Although I have obtained the dye after considerable difficulty, as yet I am not able to evaluate the practicability of the method as a clinical procedure. McMaster has demonstrated by his method, among other things, the following pertinent facts:

An intracutaneous injection is invariably an intralymphatic one.

Lymph flow in the human skin is very rapid—dye injected at ankle may present a streamer 15 cms. up the leg in five seconds.

Lymph flow is increased by heat, massage, suction, muscular activity, Bier's hyperemia.

Lymphatics, severed by a wound, instead of constricting at once like blood vessels, remain open forty-eight

hours or longer, and foreign material readily enters the opened lymphatic channels.

The most active lymph flow observed was during the reactive hyperemia following upon experimental production and total relief of circulatory obstruction.

In cardiac edema the lymphatics are much widened, the valves incompetent, and the lymph flow stagnant.

In nephritic edema, in contradistinction to cardiac, lymph flow is considerably greater than normal, although the lymphatic channels are here also widened.

We shall await with interest the application of this method of study to the various types of lyphedema.

THE MILK LEG PROBLEM

On previous occasions, I have presented theories and personal conceptions of the interesting problem of milk leg. Whether or not this condition should be included in a discussion of strict lymphedema is debatable, but that lymphatic obstruction plays a part, either primary or secondary, in its chief clinical manifestation, extremity edema, seems beyond doubt. Certainly, the old idea that milk leg during the acute attack is an uncomplicated femoral thrombophlebitis and during the chronic stages simply persistent deep venous obstruction, no longer is tenable. Furthermore, there is abundant evidence that in addition to disturbance of the deep veins and lymphatics, there is involvement of the perivascular sympathetic nerve plexus and of the associated artery. Without delving too deeply into the milk leg problem, the following facts are tabulated:

THE ACUTE ATTACK

A. INDICATIONS OF DEEP VEIN INVOLVEMENT
- Slight cutaneous cyanosis in early hours of the attack.
- Compensatory dilatation of the superficial veins.
- Aseptic thrombophlebitis found in femoral vein during pelvic exploration in several reported cases.[11]
- Experimental milk leg has been produced by extensive aseptic thrombophlebitic obstruction of the deep veins of the extremity by the injection of tissue extract, fibrinogen, alcohol.[12]

B. INDICATIONS OF LYMPHATIC INVOLVEMENT
- Edema is the chief clinical manifestation of the disease.
- Division of all the lymphatics at the groin in animals, leaving vein intact, produces edema.
- Ligation of the femoral vein in humans fails to produce edema.[13]
- Improvement follows decompression of the femoral sheath.[11]

C. INDICATIONS OF INVOLVEMENT OF PERIVASCULAR SYMPATHETIC NERVES
- Injection of salicylate of soda into the adventitial sheath of the femoral vessels is followed by edema due to involvement of the vasomotor nerves (Le Reche).
- Marked vascular spasm occurs.
- Ganglionectomy or novocaine block of the lumbar sympathetics alleviates the symptoms of the acute attack (Le Reche).

D. INDICATIONS OF INVOLVEMENT OF THE ARTERIES
- The pain of the acute attack in groin, back or calf is often so severe as to be only explained as an ischemia of arterial origin—due to arterial spasm.
- The extremity is often cold and numb, oscillometric readings are lower than in the companion extremity.
- The femoral artery was found contracted and in a state of spasm in a case operated on by Homans.

CHRONIC STAGE

A. INDICATIONS OF DEEP VEIN INVOLVEMENT
- a. Obstruction
  - Dilated collateral veins across lower abdomen.
  - Positive Perthes Test.
- b. Dilatation and incompetency
  - Varicose veins, and a doubly positive Trendelenburg.

B. INDICATIONS OF LYMPHATIC INVOLVEMENT
- The edema resembles lymphedema clinically.
- The extremity is subject to attacks of cellulitis and lymphangitis typical of inflammatory lymphedema. Elephantiasis may result from milk leg.
- Persistent edema cannot be experimentally produced by venous obstruction.
- Persistent edema can be produced experimentally by occlusion of the lymphatics with silicon and quinine.[8]
- The edema is present when there is no evidence of venous occlusion such as cutaneous cyanosis or dilated collateral veins across lower abdomen.

I shall not discuss the various theories of the initial lesion in milk leg—an acute lymphangitis, or an acute thrombophlebitis, or an affection of the vascular nerve supply. The facts enumerated are, I believe, sufficient to demonstrate that acute or chronic milk leg is, in its clinical implications, a lymphedema, and should be so classified. Three stages of the condition should be recognized: first, the acute attack of thrombophlebitis and lymphedema; second, the chronic stage of lymphedematous swelling; third, a stage of recurrent attacks of cellulitis, lymphangitis, thrombophlebitis, resulting in elephantiasis.

THE TREATMENT OF LYMPHEDEMA

The treatment of lymphedema is not highly satisfactory but there is hope that the current interest in the subject may increase our therapeutic armamentarium. There is one rule, however, that should never be violated, the swelling should always be controlled, never neglected, symptomless or causing symptoms. For the presence of edema causes an ever present vicious cycle—growth of fibroblastic tissue, attacks of lymphangitis, destruction of more lym-

phatic channels, increased edema, and so long as the tendency to edema persists, the dilated lymph vessels and large lymph spaces should be compressed by an adequate support, an elastic stocking, an "Ace" or a rubber roller bandage. The criteria for the adequacy of the support is the control of the edema, and only when trial periods have demonstrated that swelling does not recur without the support should it be discarded. The tissue fluid must be returned to the blood and lymphatic capillaries as rapidly as formed.

Other less valuable medical measures are: exercise of the limb by simple movements when standing, elevation of the extremity when sitting, the principle of standing only when walking, massage, local heat with a cradle or electric heat pad, limitation of fluid intake, a low sodium, salt free diet, the use of diuretics such as ammonium chloride, theocin, and salyrgan. Sanders' oscillating bed can be expected to benefit certain cases of lymphedema.

One might speculate on the possibility of discovering an injection method of treating dilated incompetent lymphatics analogous to the injection treatment of varicose veins. It has actually been noted that regions of the body devoid of lymphatics show no evidence of disturbed physiology. But experimental work to date, such as injection of silicon and quinine into the lymphatics after the method of Drinker, produces rather than relieves lymphedema.

A few phases of lymphedema lend themselves to special forms of therapy. The attacks of acute cellulitis and lymphangitis typical of all inflammatory lymphedema and many advanced non-inflammatory lymphedemas may be aborted by acute streptococcus antiserum, sulfanilamide or X-ray therapy. Inflammatory lymphedema secondary to epidermophytosis may be benefited by eradication of the local infection and desensitization to the trichophyton. Recurrent attacks of lymphangitis streptogenes have occasionally been prevented by streptococcus vaccine or toxoid. It may well be that, if this form of therapy were made more specific according to the prevailing methods of making streptococcus vaccines in infectious arthritis, better results would be obtained. Certain modifications and new methods have developed in the treatment of milk leg. High elevation of the extremity, fluid reduction, the use of diuretics are accepted principles, during the acute stages.[14] X-ray therapy, directed to the iliac and femoral region at the onset of the attack, has been described favorably. The use of leeches over the inflamed vein is back in favor. Early block of the lumbar sympathetics by novocaine injection is advocated by Le Reche as a means of alleviating the symptoms and lessening the severity of the acute attack. Pelvic exploration and decompression of the femoral sheath have been performed during the acute attack by Homans, with benefit in several instances. Early ambulatory practice is now a recognized procedure. Early massage is now countenanced. Subsequent support of the extremity so long as edema persists is routine. On a recent visit to Rio de Janeiro, the assistant professor of gynecology of the local university informed me that he was routinely employing Le Reche's lumbar sympathetic novocaine block at the onset of all cases of milk leg, with marked alleviation of pain and rapid subsidence of edema.

Advanced lymphedema and elephantiasis require radical surgical treatment. The present surgical methods are only partly successful both in reducing the edema and in preventing the recurrent attacks of cellulitis and lymphangitis. They should not be resorted to until all other less radical measures have been tried. Thus, the use of Unna's paste boots or elastoplast bandages may so reduce the swelling and inflammation of a greatly edematous leg that a relative lymphatic compensation occurs and simple supportive measures suffice thereafter for the control of the lymphedema. Most of the surgical methods are plastic procedures, consisting of the removal of large valveless lymph spaces and hypertrophied tissue, typical of these procedures being the Sistrunk Modification of the Kondoleum, and the recently published Homans' operation.[15] More physiologic than the above would seem to be the recently published operation of Gillies and Fraser, as described by McIndoe.[16] A bridge of skin is grafted from the arm onto the trunk and thigh, so as to anastomose the lymph vessels of the extremity with those of the trunk. Support to the theory of this operation is given by McMaster's demonstration by dye injections into the skin of the extensive and apparently continuous anastomosis of the cutaneous lymphatics.

SUMMARY

The factors in the pathogenesis of edema of the extremity are tabulated. Lymphedema is defined, and the various clinical types described. Elephantiasis and milk leg are discussed. The treatment of lymphedema is presented.

BIBLIOGRAPHY

1. Drinker, Cecil K., and Field, Madeleine E.: "Lymphatics, Lymph and Tissue Fluid," The Williams and Wilkins Co., Baltimore, 1933.
2. Allen, Edgar V., and Ghormley, Ralph K.: "Lymphedema of the Extremities; Etiology, Classification and Treatment; Report of 300 Cases," *Annals of Internal Medicine*, 9:516-539, 1935.
3. McMaster, Phillip D.: "Changes in the Cutaneous Lymphatics of Human Beings and in the Lymph Flow Under Normal and Pathological Conditions," *Journal of Experimental Medicine*, 65:347-372, 1937.
4. Sulzberger, Marion B., and Rostenberg, A., Jr., and Goetze, D.: "Recurrent Erysipelas-like Manifestations of Legs; Their Relationship to Fungus Infections of Feet," *J. A. M. A.*, 108:2189-2193, 1937.
5. Muller, George P., and Jordan, Claus G.: "Elephantiasis Nostra," *Annals of Surgery*, 97:226-236, 1933.
6. Drinker, Cecil K.: "The Relation of Lymph Circulation to Streptococci Infection," Medical Papers Dedicated to Henry Asbury Christian, Waverly Press, Baltimore, Md., 701-710, 1936.
7. Reichert, Frederick, L.: "The Recognition of Elephantiasis and of Elephantoid Conditions by Soft Tissue Roentgenograms," *Archives of Surgery*, 20: 543-568, 1930.
8. Homans, John, and Drinker, Cecil, K., and Field, Madeleine: "Elephantiasis, and the Clinical Implications of Its Reproduction in Animals," *Annals of Surgery*, 4:812-832, 1934.
9. Zolotukhin, A., Leningrad, U.S.S.R.: "Roentgenologic Method of Examination of the Lymphatic System in Man and Animals," *Radiology*, 23:455-462, 1934.
10. Menville, Leon J., and Ani, J. N.: "Roentgen-Ray Visualization of Part of the Lymphatic System," *Radiology*, 23:327-330, 1934.
11. Homans, John: "Phlegmasia Alba Dolens and the Relation of the Lymphatics to Thrombophlebitis," *The American Heart Journal*, 4:415-430, 1932.
12. Zimmerman, Lev. M., and de Takats, Geza: "The Mechanism of Thrombophlebitic Edema," *Archives of Surgery*, 23:937-953, 1931.
13. Homans, John, and Zollinger, Robert: "Experimental Thrombophlebitis, and Lymphatic Obstruction of the Lower Limb," *Archives of Surgery*, 18:992-997, 1929.
14. De Takats, Geza: "The Management of Acute Thrombophlebitic Edema," *J. A. M. A.*, 100:34 bb., 1933.
15. Homans, John: "The Treatment of Elephantiasis of the Legs," *New England Journal of Medicine*, 215: 1099-1103, 1936.
16. McIndoe, A. H.: "Experiences in the Surgical Treatment of Lymphedema," *Proceedings of the Royal Society of Medicine*, 28:1111-1126, 1933.

301-5 Medical Arts Building.

IMPERFORATE HYMEN—REPORT OF A CASE.*

J. KOTZ, M.D., F.A.C.S.,
and
MORTON S. KAUFMAN, B.A., M.D.,
Washington, D. C.

Imperforate hymen is a rather rare congenital abnormality that attains no clinical importance until the onset of the menses. Belson, in a survey of the literature, found thirty-seven cases reported between 1916 and 1936.

ANATOMY

The hymen is a thin membrane partially or wholly occluding the vaginal orifice. It is composed of two layers of stratified squamous epithelium containing between them a thin layer of connective tissue through which course a few fine nerves and blood vessels. The strength and thickness of the hymen varies from a paper thin membrane to a thick band of tissue that prevents coitus and requires surgical intervention.

The hymenal opening varies in size and shape, some of the more common forms being the crescentic, the fimbriated, the circular, the septate, and the cribriform. But it is only when it is imperforate that the hymen assumes real clinical importance.

EMBRYOLOGY

The embryological origin of the hymen is the subject of some controversy. The uterus and vagina are formed by the fused distal ends of the Mullerian ducts. These unite to form a solid core of cells, which liquefy in the center to form the uterine and vaginal canals. Until recently, the accepted theory has claimed that the distal end of this cell cord has failed to liquefy, leaving a thin band of tissue occluding the orifice.

Cunningham states that the hymen is formed by a proliferation of a small fold which arises at the point where the vaginal canal meets the urogenital sinus. C. Jeff Miller advanced the theory that imperforate hymen might be the result of a vaginal infection in intrauterine life.

*From the George Washington University Medical School, Department of Obstetrics and Gynecology.

SYMPTOMS

The symptoms of imperforate hymen are secondary to the retention of the menstrual flow. No symptoms occur until the onset of the menses. Then the patient usually complains of severe abdominal pain occurring at monthly intervals, without evidence of menstrual discharge. After a few months, there is a gradual increase in the size of the abdomen, and dysuria and constipation become marked due to pressure on the bladder and rectum. Pelvic distress and discomfort increase as the menstrual discharge distends the uterus and backs up through the tubes and into the peritoneal cavity. Weakness, malaise, and loss of appetite and weight follow. A marked secondary anemia is a common finding.

TREATMENT

The treatment is merely excision of the central area of the hymen. Excision by the electro-cautery is advantageous because the bleeding may be easily controlled without the use of sutures. Irrigation of the distended tract is not advised because of the danger of infection. Follow up treatment with the Elliott heat method promotes a more rapid absorption of the blood in the peritoneal cavity. Unfortunately, there is little hope of the tubes resuming their normal function, and the most of these patients remain sterile for the rest of their lives.

CASE REPORT

Miss H. F., age fifteen, was first seen by us on October 10, 1937. The patient stated that the present illness had begun about two months previously with constant pain in both lower quadrants and gradual enlargement of the abdomen. On questioning, she recalled that she had first experienced pain about five months previously, but that it had only lasted a few days and had then disappeared. This pain had recurred at monthly intervals, each time lasting a few days, until two months before she was seen, when it became constant and of increasing severity. The swelling of the abdomen had been noted at about the same time and had become progressively larger. She also complained of weakness and lassitude and a sense of weight and pressure in the pelvis. She had become increasingly constipated and had had some frequency. Prior to the present illness the patient had enjoyed excellent health, but had never menstruated.

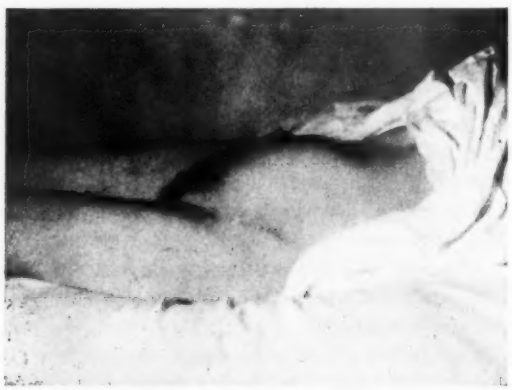


Fig. 1.—Patient recumbent, showing tumor mass extending to umbilicus.

Fig. 2.—Vulva, showing distended hymen and bulging of perineum.

Physical examination revealed a poorly nourished white female of about fifteen years of age who seemed to be in intense pain. Her face had a drawn agonized expression and she lay with her knees drawn up. Her skin was pale and moist and she appeared acutely ill.

On abdominal examination, there was a large, irregular, mass filling the entire lower abdomen and pelvis and extending to about one finger above the umbilicus. The left cornu of the mass extended up past the umbilicus to the region of the left kidney. The abdomen was tense, of a board like consistency, and exquisitely tender.

On pelvic examination, the perineum was bulging and the labia gapping. The hymen presented a shining distended surface with no evidence of an opening. It had the appearance of unruptured membranes distending the vulva in the late second stage of labor.

The patient was hospitalized immediately, and on October 11, 1937, under nitrous oxide-oxygen anesthesia, the hymen was incised. Using the electrocautery, a circular opening was made, the entire central portion of the hymen being removed. About 2,000 c.c. of dark, tarry fluid drained off following the incision of the hymen. The patient was discharged five days later, at which time the abdominal mass had entirely disappeared.

The patient was seen at regular intervals, and examination six months later showed the pelvis to still be filled with a doughy mass. The abdomen, however, was flat but the pelvic organs could not be palpated. Menstrual periods have been normal since the operation, and all symptoms have disappeared.

REFERENCES

Belson, M. O.: Imperforate Hymen. *Am. Jour. Surg.*, 36: 221, 1937.

Miller, C. Jeff.: In Davis' Gynecology Obstetrics. Hagerstown, Md., W. F. Prior Co., 1934, Vol. 2, Ch. 8.

Williams, J. W.: Textbook of Obstetrics. New York, D. Appleton and Co., 1930.

Cunningham's Textbook of Anatomy, Ed. 5, edited by A. Robinson, New York, William Wood and Co., 1922.

Sturmdorf, A.: Gynecoplastic Technique, Philadelphia, F. A. Davis Co., 1920.

1835 Eye Street, Northwest.

THE HEALING PROCESS—GENERAL PRINCIPLES.*

M. H. TODD, M.D.,
Norfolk, Virginia.

All physicians are familiar with the general plan of the healing process of severed tissue, the newly forming fibroblasts, with budding capillaries pushing across the gap. The local requirements for this process can be reduced to very simple terms—good blood-supply, the maintenance of direct contact of tissues, rest, and the avoidance or control of infection.

Blood-supply depends in the first instance upon the location of the injured tissue. Wounds and incisions about the face heal with promptness and certainty because of the excellent blood-supply, even when obviously infected from the mouth; lacerations over the shin-bone heal slowly and imperfectly, and the resulting scars are prone to break down again with little provocation. Surgery of the lower bowel is difficult and perilous, chiefly because the local blood-supply is so poor.

One of the major impediments to good blood-supply is the presence of tension. This may be due to unduly tight suturing, so that the stitch strangles all the tissue within its grasp. It is often due to swelling of the neighboring parts, and allowance for this must be made sometimes when wounds of the extremities are sutured, making relaxation incisions alongside if the wound edges will not easily meet otherwise. A most dangerous place to permit tension is in suture of the abdominal organs; it is a commonplace that they must come together easily, or the suture-line will fail and peritonitis result.

Distention of the hollow organs is an important cause of tension in their walls, impairing blood-supply and endangering the suture-line; and this is why colostomy or enterostomy or the Wagensteen method of suction is sometimes vital in surgery of the stomach and intestines, and why continuous drainage must be used in surgery of the bladder.

A classical example of the baleful effect of tension is the broken arm in children, just above the elbow, where tension may so impair the blood-supply to the whole forearm that a useless, shrunken, claw-hand—Volkmann's contracture—or even gangrene can be the result. This tension is sometimes due to keeping the elbow flexed too much, in an attempt to maintain good position of the break; sometimes, no doubt, to putting on a tight circular cast, though nowadays doctors have been warned against this procedure so often that they mostly know enough to avoid it. A most important cause, less generally recognized, is an associated rupture of the brachial artery, which permits a volume of blood to be forced into the soft tissues under the deep fascia, under full arterial

*Read before the sixty-ninth annual meeting of the Medical Society of Virginia, in Danville, Va., October 4-6, 1938.

pressure. This applies a sort of internal tourniquet to the elbow, no further blood being able to get by the barrier. Treatment is simple if radical—incision boldly through the deep fascia to relax the tension. I believe that I am correct in stating that in general, Volkmann's ischemic claw-hand should not occur; for its causes are subject to correction, and arterial anastomosis about the elbow is very free.

One of the important requirements for sound healing is direct contact of the healing tissues. The less the gap that has to be bridged, the more quickly and certainly the new fibroblasts from each side can heal together with each other; and this is of course the reason for using sutures. It is also, parenthetically, a reason for being sure that the right tissues are being sewed together. Ever so often, someone stitches a severed median nerve to the severed end of a tendon, or, in suturing a nerve, allows it to rotate so that the wrong fibres are brought into apposition and made to heal together. These are obvious errors; an error less obvious is to repair a hernia without being sure that all the fine soft areolar tissue is thoroughly wiped off from the aponeurosis, from Poupart's ligament and the conjoined tendon. If this is not accomplished, a moment's reflection will show that only the soft fatty network is really being made to heal across the gap, for this soft tissue still remains interposed between the important tendinous structures which were intended to be welded directly together by firm fibrous tissue. I am convinced that this is quite enough to explain some of the failures in hernial repair. The wrong tissues again are in contact if muscle is interposed between the ends of a broken bone, and it is no wonder that this situation is frequently followed by non-union.

Quickest and soundest healing in the depths of a wound takes place when there is no dead-space; for when the tissues are not in contact, it obviously increases the distance that has to be crossed by the delicate newly forming fibroblasts and capillaries, in order to consolidate healing. Dead-space is to be avoided by sutures of mild and even tension, carefully approximating the deep parts and holding them in direct contact, and by taking measures to prevent the collection of fluid. Careful hemostasis serves to prevent gross hematoma, but in deep wounds some serous fluid always forms. This is to be provided with an exit by spacing the skin sutures, and its accumulation prevented by mildly snug compressive dressings. It is a mistake to use a water-tight continuous skin stitch, in closing a wound of any depth; the result is apt to be an embarrassing pool of fluid, demanding exit at a time when the whole wound ought to be soundly healing.

Moreover, dead-space favors infection, for even a few bacteria readily multiply in pools of serous fluid. This again is of course an elementary commonplace of surgical knowledge. Its importance is forcibly emphasized when foreign material, such as a steel plate, is to be left in a wound, any dead-space almost guaranteeing that infection will occur.

One of the most important things to do, to favor prompt healing, is to let the wound alone. Every disturbance of the parts is likely to disturb the healing cells that are trying to cement the injured tissues together, perhaps to tear some of them loose and break up the fragile capillaries, only increasing the difficulties of their necessary work. The whole involved region is therefore to be kept quiet, and the dressing is only to be changed for some specific reason, as for example to permit the exit of excessive fluid, or to loosen the bandage if it is really too tight. The patient may feel neglected unless you change his dressing every day, but it is much sounder practice to let it alone in clean wounds. Healing is decidedly quicker if the whole patient is kept in bed for a few days.

It is true that a few special situations demand motion in the injured member. There is good authority for beginning motion in the case of sutured tendons within a day or two. Consideration, however, will show that in reality it is movement of the tendon in its relation to surrounding structures that is advised, and for the reason that healing and adhesion to them is definitely not wanted. Motion of the tendon-ends with relation to each other is prevented by the sutures; this being the place where healing is wanted. If early motion is not begun, there is a probability of both tendon ends healing solidly to the surrounding parts, which defeats the purpose of the operation of tendon-suture.

Infection practically destroys any possibility of primary healing. All the healing forces are drafted into battle against the invading army of bacteria, sapping the energy that should have been used for repair; pus is formed and demands exit, the tissues are inflamed and separated, and when the wreckage is finally cleared away, nature can only resort to delayed healing by granulation.

In a general way, lacerated wounds that are

treated within four hours or so can usually be gotten to heal by first intention if ragged tissue is trimmed away and good gross cleansing accomplished. As above noted, skin stitches are to be spaced, and a fairly snug dressing applied to prevent pooling of fluid. Small strips of thin rubber tissue may be used for definite drainage at intervals, if you like, so long as they do not touch bone or tendon. And, most important, don't forget to hang out the sign that hotel guests find so useful—"Don't Disturb." Any possibility of low-grade infection only renders this precaution the more imperative; it is most imperative of all where there is a compound fracture.

I have no comment to make on the primary use of antiseptics in the depths of the wound. It is entirely possible that weak antiseptics are useless, strong ones harmful. I have seen wounds heal, and fail to heal, both with and without them.

We have perhaps gotten away too far from the lessons learned at great cost during the war; it must not be forgotten that the correct use of Dakin's solution, with proper surgery including primary debridement and delayed or secondary closure, did bring about healing that would have otherwise apparently been impossible.

If infection takes place, the only resort is to open the wound and wait for secondary healing. The problems of infected wounds cannot be considered in this paper.

A certain gross thickness of tissue is needful for good primary healing over avascular structures like tendons or bone, otherwise the skin edge separates and healing takes place only by granulation, with an adherent scar as the result. This is the situation with lacerations over the back of the hand, for instance. Since the subcutaneous tissue here is thin, it is good practice purposely to thicken this layer by a few buried sutures, which evert the skin edges so that they stand up together as a ridge above the surface-level. I learned this little trick, among many others, from the late Southgate Leigh.

In making operative incisions in such locations, it is accepted practice to approach the deep structures through a skin incision placed somewhat to one side, curving it to form a shallow flap if necessary. This is particularly important when foreign material such as a plate or bone-graft is to be left in place.

Foreign bodies present a special problem in which there is perhaps no general rule to follow. Most small projectiles, if buried deep, will heal in place and give no trouble, and it is not really necessary to remove them. Ten thousand men now walk the streets with machine-gun bullets and even rough pieces of shrapnel still buried somewhere inside, demonstrable only by X-ray. Many colored brethen have been sprayed with buckshot in the chicken-yard, with temporary pain and chagrin as the only untoward result. Where, however, gross pieces of overcoat or shoe-leather are carried in along with the bullet, the whole mass of foreign material will have to be removed. In any case, where an abscess forms, a retained foreign body will prevent healing indefinitely. Foreign bodies introduced at operation, such as steel plates or nails, will only heal in place if rigidly aseptic technique is used. The skin should be completely blocked off. Lane technique is best.

It has been very illuminating from time to time, to watch some of the older surgeons handle the problems of healing. I pay tribute here again to the late Southgate Leigh, for instance, who would treat a severe compound fracture by opening everything widely, trimming off ragged muscle and fascia, adjusting the bone with or without internal fixation, and then closing the wound with a few spaced interrupted sutures. He then put on a voluminous padded dressing with a snug bandage, applied a cast, and left the whole thing strictly alone for about a month. I observed no delicate finesse in his work, but you will note that he saw to every one of the fundamental principles that aid in prompt healing, with emphasis on bandaging to eliminate dead-space, enough room between the stitches for seepage of excess fluid, and complete rest and quiet of the injured parts; and I assure you from observation that healing was indeed prompt and by first intention.

The most familiar wound we have to consider is of course the abdominal incision. Curiously enough, even very good surgeons fall into routines of closure that do not always fit in with the laws of sound and speedy healing, and some of them would be chagrined occasionally if they dressed all their cases in person. A common custom, even when the patient is fat, is to close the skin water-tight with a running dermal stitch, and apply only a loose dressing. All goes well for a week, when a little rise in temperature is noted; and about the tenth day someone has to separate the wound edges with a clamp, and is rewarded with half a cupful of chocolate fluid. This only happens occasionally, it is true, and no great

harm is done; but it is not the desired per priman healing either.

The explanation of this minor calamity is probably simple. Bloody fluid has collected in the fat layer, partly from oozing, partly from broken down fat, as perhaps it always does. It has happened to gather in sufficient quantity to fail of absorption, so that an outlet is demanded.

In this connection, it has been my fortune to observe an abdominal wound when the patient woke up a moment too soon, and vomited, before I had completed closure. I had thought that hemostasis was good, but during this bout of vomiting, she bléd from every pore in the fat layer. I am quite sure that any patient who vomits immediately on waking, oozes a little blood into the depths of the wound.

The remedy, then, is also simple enough; don't sew up the skin water-tight in patients with a thick fat layer; but leave a little room between stitches for bloody serum and broken-down fat to exude. Better still, insert three or four narrow strips of thin rubber, to drain separately each of the three or four compartments in the fat layer that are closed off by the silk-worm tension sutures. And be certain that the adhesive is snug enough to make a little moderate pressure on the incision, to eliminate dead-space. I can assure you that this simple procedure, practiced in patients with a thick fat layer, has avoided this sort of trouble in my own hands, in recent years, with almost complete certainty.

To cite, now, one of my own technical errors, I lengthened a short Achilles tendon by open operation, sewed it together with silk, and then closed the skin water-tight, according to a familiar routine. I bandaged the ankle snugly, and no doubt all would have gone well if the patient had not had quite a thick layer of subcutaneous fat, and if I had kept her strictly in bed for a few days. Instead, I let her go home in a day or two, hanging the foot down for a brief time while getting in and out of her car. The result, as in the abdominal wounds I spoke of above, was a collection of fluid, and, when I opened the incision to let it out, a mild infection compelled me to go in after my silk suture in the tendon. All this was entirely unnecessary, and was due only to following mechanically an accepted surgical routine without further thought. The correct procedure would have been to suture the skin with interrupted stitches or Michel clips, leaving a little space between them to permit oozing; and I should have insisted on keeping the leg strictly horizontal for several days more than I did. Again, no great harm was done, but it was a doctor's wife I was treating, and he was perfectly well aware that I should have obtained primary healing, though he was kind enough not to take me to task about it.

When the primary healing process fails, nature substitutes secondary healing, a slower and less perfect process, but usually fairly satisfactory in the end. In certain situations, however, complete failure of primary healing is a serious and even a fatal matter. This is especially true of the abdominal incision. Disruption does not occur often, but according to the literature even experts have had it happen. I am glad that I am in good company, for it happened to me about fifteen years ago; since then I have no longer classified the closure of an abdominal wound under the heading of a minor routine, to be left to the resident.

The causes of disruption are many; analyses have sometimes implicated imperfect suturing of the peritoneum, an omental tag pushing into the gap and widening it. This would be a decided possibility in the upper rectus region, for here the fibres of the sheath run transversely, and sutures can pull out between them. Undue strain on the incision certainly plays a part, and I am one of those who believe in strapping abdominal incisions quite snugly to take off some of the strain on the stitches. Precision of layer suture is not entirely essential. Mass suture of the abdominal wall results in strong healing, and indeed mass suture is resorted to as a method of repair of disrupted wounds.

General causes appear to play a major role in wound disruption; and these include catgut allergy and protein insufficiency as well as general debility and poor general healing power. These general conditions come under the head of medicine rather than surgery, and this is one reason why medical consultation is so desirable in treating seriously ill surgical patients. Much can be done by general measures including transfusion, to increase resistance and healing power; and operation should only be done when the patient has been put in as good general condition as is possible under the circumstances.

I am sometimes inbued with enough pride of craft, by the way, to permit myself the conceit that a surgeon is apt to know more about a patient's general condition than any but very expert medical men—that is, how much he will stand and what the limits

of any advisable operation may be. I hope that I shall be forgiven this heresy by my medical colleagues, for whose judgment I have the sincerest regard. Let the surgeon and the internist, each in the pride of his craft, do each the utmost in his power to see that the limit of the patient's endurance is not approached, far less reached, by any procedure intended to heal him. For each must depend upon the other for his special knowledge.

In summary, then, let me emphasize the avoidance of tension; the use of spaced interrupted skin sutures when the fat layer is thick, or oozing is likely, or when the wound is probably contaminated; the use of moderately snug dressings to overcome dead-space; strict rest to the involved part; and the avoidance of stereotyped routines followed without thought of their effects in detail. And let me call attention, as all writers do sooner or later, to the fact that it is the whole patient, not the local operation, that must be considered; and that for his healing, and even his survival, he must be in the best general condition possible under the circumstances surrounding the case.

712 Botetourt Street.

Correspondence

A Correction.

TO THE EDITOR:

My attention was called to an article in your publication of February, 1939, by Drs. Emmett, Fliess and Yorkoff. (Vol. 66, No. 2, p. 107). On that page, in the second paragraph, the following quotation of my article appears: "There is no rebound tenderness on the right side", etc. This is erroneous. In my article and in the reprints I state that there is always a certain amount of rebound tenderness but no rigidity. In fact this is one of the diagnostic aids and facilitates the diagnosis.

New York City, WM. KLEIN, M.D.
May 10, 1939.

Public Health Statistics

I. C. RIGGIN, M. D.,
State Health Commissioner of Virginia.

The report of the Bureau of Communicable Diseases of the State Department of Health for April, 1939, compared with the same month in 1938, follows:

	1939	*1938*
Typhoid and paratyphoid fever	6	20
Diphtheria	56	50
Scarlet fever	139	153
Measles	2,681	2,603
Meningitis	3	14
Poliomyelitis	1	2
Rocky Mountain spotted fever	0	0
Typhus fever	0	0
Undulant fever	1	6
Tularemia	1	1

MALNUTRITION

At intervals, during the last ten years, it has been estimated by those investigating the subject that from 15 to 20 per cent of all children in the United States were to some extent suffering from malnutrition. That this condition exists to such a marked degree is fully appreciated both by physicians and public health officials.

Malnutrition is a relative term, well understood but difficult to define concisely. It signifies an interference in the proper building up of body tissues and in the liberating of energy. It is to be distinguished from undernourishment. Malnutrition is largely a qualitative term; undernourishment, on the other hand, is a quantitative one, though they may overlap and usually do.

While poverty is recognized as a contributing cause of malnutrition, the surveys indicated that no class in the economic scale was immune. Indeed, in some localities, reports showed that children in the upper income group were malnourished to an even greater extent that many children of the poor.

The investigations also elicited that mentally retarded children, as distinguished from the mentally defective, frequently were below weight and height for their body-type and age. This led to the conclusion that some children have been classed as mentally defective when their retardation was merely a matter of prolonged lack of the proper kinds of foods in sufficient quantities. As is well known, the symptoms of malnutrition usually include absence of physical and mental energy, inattention, poor memory, slow comprehension, and unusual restlessness.

The prevalent custom of weighing and measuring a child, followed by a comparison with the weight and height chart in itself, without consideration of body-type, is no longer considered efficient; in fact, at times it results in a grossly inaccurate picture.

Striking cases of malnutrition due to starchy diets have been noted where the weight and height for age compared favorably with the chart. Consequently, weight and height charts should be used only as one index of a child's condition. A proper consideration of the individual body-type is extremely important in reaching the proper conclusions. If the facts thus brought out are complemented by a medical examination, it is possible to differentiate between those who are malnourished and those who are undernourished.

It has been the experience of the physicians connected with the clinics of the State Department of Health that too much emphasis cannot safely be placed on whether or not a child is within or below the 10 per cent chart average. It follows that those children who have below-average bodies, or those who are having defects corrected, require re-examination at close intervals to check on the progress of their physical development. Individual *types* cannot be changed or markedly modified by the forcing of food or calorie intake.

As is well appreciated, faulty health habits, acute disease, physical defects, especially diseased tonsils and sinus infections, chronic otitis media, carious teeth, eye-strain, syphilis, tuberculosis, chronic overfatigue, nervous excitements due to examinations, too much home-work, too many outside activities, either mental or social worry, too little outdoor activity, too little sleep, and faulty dietary habits, singly or in combination, are important causes of malnutrition.

Consequently, while, as previously observed, poverty is doubtless back of many malnutrition cases, parental coddling, ignorance, and shiftlessness are sometimes large contributing factors. A careful history followed up by a thorough physical examination will usually produce findings which, when evaluated properly, will enable the medical examiner to give an efficient service to the patient.

The importance of infections of the tonsils, teeth, and nasal sinuses is sufficiently well established to demand that these structures be investigated when general health is impaired. While there can be no doubt about the wisdom of eradicating known foci of infection, there is real danger that meddlesome treatment will at times be undertaken when it should have been avoided. The improvement in appetite which follows the removal of infected tonsils is sometimes marked. However, it does not always follow that whenever a child has a poor appetite he will show improvement after the tonsils have been removed.

Physical defects of necessity will react adversely upon nutrition. Poor nutrition thus produced in turn will result in a decreased neuromuscular tone, increased fatigability, poor posture, poor functional activity of the respiratory system, the circulatory organs, and the digestive tract. The effect of all this will be a still greater impairment of nutrition with the establishment of a vicious cycle.

Unless measures are instituted to correct the condition or the conditions primarily responsible, more serious results of defective nutrition may manifest themselves. Among these there may be a severe nutritional anemia, which will take months of careful treatment to correct. Frequent infections of the upper respiratory tract also may result. The problem thus becomes a complicated one. The correction of physical defects alone may not be sufficient to effect an improvement in nutrition at this stage, since the disturbed nutrition itself, if of long standing, may have caused damage to many tissues and organs of the body.

The State Health Department's clinic experience has demonstrated that every case of disturbed nutrition should have the benefit of careful medical examination and advice in addition to the *proper* comparison of weight and height with the weight and height chart.

YELLOW FEVER VACCINATION

In a recent letter addressed to the State Health Department from the U. S. Public Health Service, the Service offers free vaccination against yellow fever to medical personnel in infectible territory of this country, including Virginia. It is known that the Aedes aegypti mosquito may be found in certain areas of this State at certain times.

In making this offer the Service hopes that by this means a nucleus of immunes may become available to be called on for immediate assistance in combating the disease should an outbreak occur.

The vaccine used would be that supplied by the Rockefeller Foundation. It is administered in a single injection and in the great majority of cases causes very little or no discomfort. In a small proportion of cases, there has appeared a slight rise of temperature with some malaise on the seventh or eighth day.

The Department has been advised that excellent results have been obtained in recent months in the

control of yellow fever in South America by the immunization of persons exposed to, or living in, infected areas. Over one million such vaccinations have been performed in Rio de Janeiro and adjoining states, with immunity effectively established.

Any physician in Virginia interested in establishing personal immunity against yellow fever should contact Assistant Surgeon General C. L. Williams, Foreign Quarantine Division, U. S. Public Health Service, Washington, D. C.

Woman's Auxiliary to the Medical Society of Virginia

President—MRS. HAWES CAMPBELL, Venter.
President-Elect—MRS. HENRY A. LATANE, Alexandria.
Corresponding Secretary—MRS. PAUL PEARSON, Aylett.
Recording Secretary—MRS. E. LATANÉ FLANAGAN, 3413 West Franklin Street, Richmond.
Treasurer—MRS. REUBEN F. SIMMS, 2502 Hawthorne Avenue, Richmond.
Chairman, Press and Publicity—MRS. WILBERT E. BUTLER, 217 East Indian River Road, Norfolk.

Address by Dr. Moncure to Woman's Auxiliary.*

I don't know whether I am going to accept this job another year, even if Alex. Robertson and the members of the Auxiliary ask me to serve on it. I am superstitious. In the Negro ward of the hospitals of Norfolk, if one patient dies, every Negro in the ward who can travel, and many who can't, are trying to check out, saying they are well enough to leave. The slogan is: If one dies, at least three will die; and each one is afraid he will be next. I hold the position of chairman—it is an honor; and the work, if you could call it work, attached to it is a real pleasure. But is the job safe? A few years ago Dr. Leigh was chairman. What happened to him? He is now only a sweet memory of the past. Succeeding him, and following him in rapid succession, were our dear old friends, Drs. Hodges and Fletcher Wright. I feel as if maybe I had better do as the Negro patients did—resign and leave while the leaving is good. Maybe Alex. Robertson will appoint young men, men capable of doing more for you than I. But I want to say this for the three chairmen who have preceded me: You may find younger, and even intellectual giants, but you will not find more loyal, truer, enthusiastic friends of your cause than the three chairmen I have just mentioned.

Your secretary, in inviting me to this luncheon, asked me to make an address, and said I could talk to you on any subject I wished—the only stipulation she made was that it should be *short*. I then began to think: What subject could I speak on a few minutes, and make it interesting? I shall mention a few of them, and my reasons for discarding them: (1) *The Doctor's First Assistant.* I discarded it at once. The title would be written backwards—the doctor is the assistant, not his wife. (2) *The Doctor's Silent Partner.* I discarded it. You know why. Impossible! You know full well the doctor could not keep his wife silent. (3) *How far Should the Doctor Take His Wife into His Confidence, and Practice?* The subject would be a violation of the Hippocratic Oath. (4) I thought of another good one: *Burying the Doctor's Mistakes.* I thought how nice a paper I could write on that subject, and how true it would be, but our mistakes are so many, my paper would be so long. My wife would surely be burying me, my patients, and my friends or I might bury her. I surely would be burying my patients. Then I decided that the best subject I could write, or talk about, would be: *The Doctor's Wife—His Greatest Comfort in Moments of His Greatest Perplexities, and Needs.*

There is no physician who possesses a soul, and practices medicine—whether he be general practitioner, surgeon, pediatrician, obstetrician, or any other specialist—who does not suffer, and bleed, and die with his patient; and in these darkest hours when he comes home in the depths of woe, perplexed to the last limit over some case that was not turning out as he had hoped; and when the family and patient were all looking to him to do perhaps some miracle; when he dares not tell the family of the patient what he fears; and he is at the end of his tether, who is it that can give him comfort but his faithful wife? She intuitively knows it all—by the look on his face—before he tells her a word. He may not even tell her, but the simple touch of her hand, perhaps a kiss, or one little bright word of encouragement from her smooths away his fears, and gives him that assurance that can come from no other source. When he makes an error in diagnosis, or judgment (and

*Address given at the annual meeting of the Woman's Auxiliary to the Medical Society of Virginia, October, 1938, by Dr. P. St. L. Moncure, chairman of the Advisory Board from the State Society.

we all make them), and things have not turned out just as he had hoped, it is his sweet and faithful wife who can reassure him and make him feel that he did the very best thing that could have been done under the circumstances. They usually think their husbands are the greatest physicians on earth. She enters into his thoughts, and thinks, and speaks for him—she will even lie for him.

Again he has a remarkable, difficult case—he studies it hard; she encourages him in his studies—keeps things quiet for him; he makes a brilliant success in his diagnosis and cure; he needs encouragement; he needs someone to pat him on the back; the profession and outside world care nothing for him—will not even read his carefully written account of it. It is his ever faithful wife who is carried away with the successful outcome of his case. *She is his inspiration, whether he knows it or not.*

I know of no better way to close these remarks than by quoting the lines of Owen Meredith:

"The mission of woman on earth! To give birth
To the mercy of Heaven descending on earth.
The mission of woman: Permitted to bruise
The head of the serpent, and sweetly infuse,
Through the sorrow and sin of earth's registered curse,
The blessing which mitigates all; born to nurse
And to soothe and to solace, to help and to heal,
The sick world that leans on her."

My dear girls, you do not realize the great good you do, the power you have. To quote another poet—the ancient greek Anacreon—in his twenty-fourth ode (this is taken from Dr. Theophilus Parvin's address on woman):

"To man she gave in that proud hour
The boon of intellectual power.
Then what, O woman! What for thee
Was left in Nature's Treasury?
She gave thee beauty—mightier far
Than all the pomp and power of war.
Nor steel, nor fire itself hath power,
Like woman in her conquering hour.
So be it fair, mankind adores thee,
Smile and the world is weak before thee."

Radio Health Broadcasts.

June 7—*Vacations: Why and How*—Making the vacation a real contribution to health and recreation.

June 14—*Never Stop Learning*—A new phase of life begins at commencement, and health contributes to success.

June 21—*Answering Your Questions*—What kind of health questions can be answered and what kind can't without seeing the patient?

Truth About Medicine

In addition to the articles previously enumerated the following have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association:

The Upjohn Company

Ampoule Solution Sodium Morrhuate 5 per cent with Benzyl Alcohol 2 per cent, 2 cc.

Solution Sodium Morrhuate 5 per cent with Benzyl Alcohol 2 per cent, 30 cc. vials.

Ampoule Solution Sodium Morrhuate 10 per cent with Benzyl Alcohol 2 per cent, 2 cc.

Solution Sodium Morrhuate 10 per cent with Benzyl Alcohol 2 per cent, 30 cc. vials.

Tablets Sulfanilamide, 5 grains.

Tablets Sulfanilamide, 7½ grains.

New and Nonofficial Remedies

The following products have been accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in New and Nonofficial Remedies:

Mead's Nicotinic Acid Tablets, 20 mg.—Each tablet contains nicotinic acid (*The Journal*, July 2, 1938, p. 27), 20 mg. Mead Johnson & Co., Evansville, Ind.

Hypodermic Tablets Digitalin (German, Pure, Merck), 0.00065 Gm., 1/100 grain—Upjohn.—Each tablet contains digitalin, "German" (New and Nonofficial Remedies, 1938, p. 191), 0.00065 Gm., 1/100 grain. The Upjohn Company, Kalamazoo, Mich.

Tuberculin Ointment (Wolff)—Lilly (New and Nonofficial Remedies, 1938, p. 408).—A culture of human tubercle bacilli (H-37) of four weeks' growth in glycerin broth, sterilized, evaporated to one-fifteenth its original volume and triturated to a smooth mixture, to which 0.4 per cent of phenol is added as a preservative. It is proposed for use as a tuberculin test by the patch method. Marketed in packages of one 2 Gm. collapsible tube with a 2 Gm. control tube. Eli Lilly & Co., Indianapolis, Ind. (*J. A. M. A.*, April 1, 1939, p. 1257.)

Cinchophen—The Upjohn Company.—A brand of cinchophen—N. F. (New and Nonofficial Remedies, 1938, p. 177).—The product is marketed in the form of tablets, 5 grains and 7½ grains. The Upjohn Company, Kalamazoo, Mich.

Solution Liver Extract Purified—Lilly.—A sterile aqueous solution of liver extract purified preserved with 0.5 per cent phenol, containing 15 U.S.P. units per cubic centimeter. Solution liver extract purified—Lilly is proposed for intramuscular injection in the treatment of pernicious anemia. It is marketed in packages of three 1 cc. rubber-stoppered ampules. Eli Lilly & Co., Indianapolis, Ind. (*J. A. M. A.*, April 22, 1939, p. 1591.)

Propaganda for Reform

"Vitamin K." A Principle Useful in Certain Hemorrhagic Conditions.—The Cooperative Committee on Vitamins, representing a combined committee of the Council on Pharmacy and Chemistry and the Council on Foods of the American Medical Association, considered the evidence for a principle called "Vitamin K," reported to be useful in the treatment of certain hemorrhagic conditions. The Committee recommended that a preliminary report be issued on this principle and the recommendation was adopted by the Council on Pharmacy and Chemistry. Dr. A. M. Snell of the Mayo Foundation, who has been working with this principle, prepared a report which was adopted by the Council for publication. The Council agrees with Dr. Snell that the principle known as Vitamin K appears to have therapeutic usefulness in the hemorrhagic manifestations of hepatic and biliary disease. The Council has authorized its Committee on Nomenclature to study the question of a suitable nonproprietary name which shall not be therapeutically suggestive. The Council voted also to consider with view of acceptance brands of "Vitamin K" under strictly limited claims for usefulness in the hemorrhagic diathesis of hepatic and biliary disease. (*J. A. M. A.*, April 15, 1939, p. 1457.)

Report on the Use of Roentgen Rays for Contraception.—In 1932 Harris (Am. J. Roentgenol., 27:415 (March), 1932) and in 1936 Mayer, Harris and Wimpfheimer (J. Obst. & Gynec., 32:945 (December), 1936) published articles dealing with the use of roentgen rays to produce therapeutic abortion. Their results were satisfactory, and they advocated this method as particularly desirable in cases in which surgery is hazardous or contraindicated for medical reasons. At the organization meeting of the Council's Committee on Contraceptives, it was suggested that roentgen rays had been used to cause sterility in women or to interrupt pregnancy for nonmedical reasons. Dr. A. U. Desjardins, in an effort to determine how extensively roentgen rays are being used for these purposes, wrote to twelve radiologists throughout the country. In all but one instance the replies from these men stated that they were not aware of such a practice, certainly on the part of reputable members of the profession, and were doubtful whether this technic was being employed to any appreciable extent by less scrupulous practitioners. (*J. A. M. A.*, November 5, 1938, p. 1767.)

Racephedrine (Racemic Ephedrine), Racephedrine Hydrochloride (Racemic Ephedrine Hydrochloride) and Racephedrine Sulfate (Racemic Ephedrine Sulfate).—The Council on Pharmacy and Chemistry reports that the manufacturer of a brand of synthetic racemic ephedrine hydrochloride asked the Council to adopt a nonproprietary name. The Committee on Nomenclature voted that the name Racephedrine be recognized as a nonproprietary designation for the racemic ephedrine base and that Racephedrine Hydrochloride be the name for racemic ephedrine hydrochloride. The Council voted to include Racephedrine Hydrochloride in New and Nonofficial Remedies. The Council has under consideration Racephedrine and Racephedrine Sulfate. (*J. A. M. A.*, April 1, 1939, p. 1256.)

Book Announcements

Failure of the Circulation. By TINSLEY RANDOLPH HARRISON, M.D., Associate Professor of Medicine, Vanderbilt University School of Medicine, Nashville, Tenn. Baltimore. The Williams and Wilkins Company. 1939. Second Edition. Revised. Octavo of xiv-502 pages. Cloth. Price, $4.50.

A review of this book appears in the editorial columns.

Surgical Treatment of Hand and Forearm Infections. By A. C. J. BRICKEL, A.B., M.D., Departments of Anatomy and Surgery, Western Reserve University. St. Louis. The C. V. Mosby Company. 1939. Octavo of 300 pages. With 155 Text Illustrations and 35 Plates Including 10 in Color. Cloth. Price, $7.50.

The first hundred pages of this book are given over to a discussion of that portion of the anatomy of the hand which is most important in relation to infection. There are thirty-two excellent plates, showing the relations of the various structures and spaces at different levels and planes. Eighteen of them illustrate the results obtained by the injection of a radiopaque substance into the important spaces. In general, the results of these injections are the same as those shown by previous authors, with the exception that a separate mid-palmar space medial to the insertion of the adductor pollicis muscle was not demonstrated. This section of the book is probably the most important part, for it is obviously impossible for a surgeon to treat injuries or infections of the hand intelligently without having a thorough understanding of this anatomy.

In the mid-portion of the book, pages 100 to 260, the general principles of the treatment of hand infections are discussed, as well as the specific treatment of infections in the various spaces. This section is illutrated by a number of excellent photographs which add to the value of the book.

The last part of the book contains discussions of human bites of the hand, the effect of various constitutional diseases on hand infections, and the medico-legal aspects of such infections. The section on human bites is not as complete as one might wish.

The print is good and the photographs and plates are well reproduced. The descriptions of some of the operative procedures are sketchy but most of them are satisfactory.

This book should be a distinct addition to the library of any physician but should prove especially valuable to medical students, house officers, and young surgeons. I. A. BIGGER, M.D.

Virginia Medical Monthly

Founded by LANDON B. EDWARDS, M. D., April, 1874
Owned by MEDICAL SOCIETY OF VIRGINIA since November, 1919
WYNDHAM B. BLANTON, M. D., *Editor*
AGNES V. EDWARDS, Richmond, *Business Manager*

PUBLICATION COMMITTEE
WYNDHAM B. BLANTON, M. D., Richmond, *Chairman*
J. EDWIN WOOD, JR., M. D., University H. A. TABB, M. D., Gloucester

All correspondence regarding editorial matters, articles, advertisements, subscription rates, etc., should be addressed to the Monthly, 1200 East Clay Street, Richmond, Va.

This journal is not responsible for the opinions and statements of its contributors.

All advertisements are received subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association.

Subscription Price: $2.00 per annum in advance. Single Copies 25c.

VOLUME 66 JUNE, 1939 No. 6

Editorial

The White Doctor's Case.

Commenting upon the A.M.A.'s refusal to admit colored doctors to its constituent societies, an editorial in the *Richmond Times-Dispatch* of May 17, 1939, closed by saying: "Unless the Southern white physicians open the doors of their local societies to these doctors, they cannot get in touch with the vital current of medical thought in America."

The medical care of the negro race through the years of this country's existence has been borne largely by the Southern doctor. To him are the diseases peculiar to the race best known and to him has come an understanding and appreciation of the problems of that race unexcelled by that of any other segment of society. His regard for the negro doctor and his desire to help him are sincere and founded upon knowledge, but faced with the proposal made by the esteemed writer of the editorial in the *Richmond Times-Dispatch,* the average doctor will find himself unable to agree with its contentions. He will recall that there is a national medical association composed exclusively of negro doctors and that in Virginia there is the Old Dominion Medical Society similarly constituted. He knows that "the vital current of medical thought" does run in local medical societies, but that it is chiefly to be found in the many medical journals published in this country which are equally available to white and colored doctors. He knows that all who wish may read, learn and inwardly digest their contents. He knows that in many instances colored doctors have been welcomed as visitors to medical meetings and that in many medical schools they are being taught side by side with white students. Perhaps the average Virginia doctor, as things now are, would not object to negro students being admitted to his own medical schools. It is logical that the institutions of higher learning, so impossible of duplication for the negro because of the prohibitive expense that would be involved, tax supported and state owned as they are, should make their opportunities available to all who desire them and can take them. It is in such institutions too that one can reasonably expect to find that broad intelligence that can see old *mores* set aside with the least trauma. Each year the Medical College of Virginia gives a course of postgraduate instruction to colored physicians, and teachers and students alike enjoy the course. These things are right and proper because they are a part of the general distribution of the services of the free institutions to which, under the constitution, every citizen is equally entitled.

It is true, as our editorial writer believes, that a medical society is a scientific body, but it is also a private organization. Its control, its principles and purposes, are vested solely in its membership. As a matter of fact, medical societies are not entirely scientific associations; they are partly social. Time

and again doctors have tried to conduct purely scientific meetings in their societies only to discover that their meetings succeed best when social features are added. The North Carolina Medical Society held its annual meeting this year on board ship accompanied by wives and daughters, with social features a prominent part of the program. The Medical Society of Virginia will close its meetings this fall in Richmond with a banquet and a ball. The Richmond Academy of Medicine building contains a banqueting hall, a kitchen, a commodious lounge and library—all frequently used, greatly enjoyed, entirely a part of the life and usefulness of this center of Richmond's medical progress. At the close of every Academy meeting a social gathering is featured.

"Southern white physicians are urged to open the doors of their local societies to these doctors." The writer of those words had probably never attended a medical meeting and did not know that those doors lead straight to a break in the social isolation of the two races, which is essential if racial purity and integrity are to survive. With malice toward none, we are sure those doors ought not, for the present at least, to be opened in the sense of the words employed by the editorial writer.

There are times when what is ideally right is wrong because it is impractical. This is the answer not only to this editorial but to much of what the lay public and press have said to and about the medical profession in the last few years. Those who believe most firmly in the American way of life believe about this question as they do many another question: that doors always open to races, to sexes, to individuals, in answer to their own honest effort—effort which may have to be sustained through the years, often in hardship, often in discouragement, often in unfairness, often in injustice. Few doors open of their own accord to anyone, male, female, black or white, and few doors are opened by benevolent commentators. Life is harder than that, but one of its chief glories is self-determination.

A Good Book and a Moral.

The second edition of Tinsley Harrison's *Failure of the Circulation* (Williams and Wilkins, Baltimore, 1939) reveals many changes. In his first book Harrison attempted to combine the clinical and physiological aspects of heart disease in a readable composition. In his second he states that his object is to reduce the discrepancy between our knowledge of what happens in heart disease and our understanding of why it happens. This he attempts to accomplish by an analysis of "the several major syndromes and the functional basis of each". Acknowledging that we have very few methods for treating the causes of heart disease he proposes to emphasize the treatment of the results. In this edition there are some additions, some rearrangements and some alterations in terminology. It is a book in which the southern medical profession can well take pride as the author is one of the faculty members of the School of Medicine of Vanderbilt University. Virginia lays a characteristic genealogical claim to him since his mother was born in this State.

It is to be noted that Dr. Harrison is only one member, and a younger one at that, of the Medical Department of Vanderbilt University. His book well illustrates what can be accomplished by team work in a medical school and the spirit of cooperation that should dominate practice, administration and research in every department of a teaching institution. Perhaps it also explains why Vanderbilt is now generally recognized as one of the great medical schools of this country.

Medical Mussolini.

Those who admire the editor of the *Journal of the American Medical Association* will be horrified at Morris A. Beale's account under this title of the character and demeanor of a well-known medical figure. The medical profession should be warned against wasting its time seeking his portrait here. We do not know what is to become of the serious charges made in the book, but we venture to say that a stultifying silence is all they deserve.

The 54th Meeting of the A.A.P.

The president's address opened the American Association of Physicians meeting in Atlantic City with a plea for a therapeutic housecleaning, emphasizing the obvious point that it is more difficult to get rid of useless drugs than it is to introduce new ones.

George Baehr showed that it was apparently possible to "cure" syphilis by massive intravenous doses of arsphenamine given by the drip method over a period of five days at the rate of a gram a day.

Herrman Blumgart demonstrated that digitalis does not ordinarily increase pre-existing partial heart block, and in the discussion that followed it was pointed out that Stokes-Adams' disease itself is usually not a contraindication to digitalis therapy.

Albert Snell, discussing the absorption and utilization of Vitamin K in hæmorrhagic disease, showed that Vitamin K must be in the diet, that the intestinal surface must be intact, that bile must be present for its absorption, that prothrombin, to the formation of which this vitamin is essential, is formed in the liver, and that damage of the liver prevents the utilization of ingested Vitamin K.

Cyrus Sturgis, commenting upon 150 pernicious anemia deaths, related only 7 per cent of them to actual anemia, and showed that one-half of them had died from unrelated causes. Although the expectancy of life has been greatly prolonged by the newer parenteral administration of liver extract, death still comes to those in this group earlier than to the average person.

Henry Christian showed that experimentally the flow of blood in human kidneys was not retarded by renal sclerosis, and that in the presence of arteriosclerosis extrarenal atheroma was more frequent than renal atheroma.

B. S. Oppenheimer commented upon the few isolated cases of unilateral renal disease associated with hypertension, in which nephrectomy had been therapeutically effective, and reported out of 5,000 autopsy protocols eighteen cases in which unilateral vascular narrowing had been associated with hypertension, an incidence of 85 per cent.

A. E. Cohn discussed essential hypertension and diseases of the kidney, and the consensus of opinion seemed to be that whereas the Goldblatt method undoubtedly produces hypertension with astonishing regularity, narrowing of the arterioles as well as of the larger vessels must also be evaluated and further investigation pursued before the results of animal experimentation can be profitably applied to an understanding of hypertension in man.

Francis Rackemann, in discussing the relation of asthma and periarteritis nodosa, suggested a diagnostic triad of pain and numbness in extremities, eosinophilia and asthma. The combination was discovered in 10 per cent of the 200 cases of periarteritis nodosa on record.

John Paul presented evidence to show that the skin and mouth rather than the nose are portals of entrance of the virus of poliomyelitis. He emphasized the frequency with which the virus may be recovered from the stool and the importance of this fact in the clinical epidemiology of the disease.

Hobart Reiman called attention to a recent outbreak of an acute respiratory infection occurring in several parts of this country eventuating in an atypical pneumonia, which, although it is probably a virus disease and has some of the earmarks of influenza, was nevertheless clinically, culturally and serologically different from it.

Alphonse Dochez, in commenting upon the same disease observed in New York, emphasized its extreme communicability, its fourteen to eighteen day incubation period, its polynuclear leukocytosis, its slow pulse, tendency to relapse, ten day to ten week duration, low mortality, and virus type of lung pathology strikingly resembling psitticosis. The disease may closely simulate typhoid in its early manifestations.

Francis Blake reported his experience with sulfapyridine in pneumococcal, streptococcal and staphylococcal infections. A general discussion of great interest ensued.

E. K. Marchall, agreeing that sulfapyridine was pharmacologically more active than sulfanilamide, presented evidence to show that in animals at least it might be a very toxic drug, the high percentage of vomiting which complicated its use being attributed to a central effect.

Burgess Gordon thought that mechanical factors, such as suction, created in the opposite pulmonary cavity were responsible for bilateral collections of pleural fluid after pneumothorax.

Paul White, discussing striking pulsations of the internal jugular vein observed in tricuspid valvular disease, called attention to the importance of ruling out arterial pulsations by pressure over the bulb. In the discussion that followed it was brought out that the pulsations which accompany right-sided failure are the first to disappear with improvement, that the long standing pulsations are of very long standing and that the patients exhibiting them are relatively comfortable. A peculiar greenish color of the skin, a component of jaundice and cyanosis, was referred to as a sign of valuable diagnostic importance.

Frank Wilson showed electrocardiographic tracings with prominent S deflections and with low S.T. takeoffs in Leads II and III accompanying anginal attacks, which were relievable by nitroglycerine and were precipitated by smoking tobacco.

William Kerr advocated the use of an elastic abdominal support in anginal patients with large and pendulous abdomens, claiming that all but four of 200 such patients so treated remained pain-free with-

out other therapeutic measures. He explained the efficacy of the belt by stating that it increased the diaphragmatic excursions and improved the efficiency of the cardiac output.

Henry Christian emphasized the fact that many measures were available and successful in the management of patients with angina pectoris and urged the trial of one after another until a successful method was discovered. Among the changes which experimentally follow temporary occlusions of the coronaries, Baird Hastings showed that extracellular edema (10 per cent) might be one. Among the drugs capable of altering induced anoxemia in patients with coronary sclerosis, according to Robert Levy, aminophyllin was shown to increase the volume output of the heart 25 to 35 per cent. In spite of individual differences in the effect noted, toxic manifestations were rare.

Elliott Joslin, describing the so-called neuritis of diabetes as a neuropathy of central, rather than peripheral origin, and of metabolic rather than of inflammatory nature, stressed the incidence of high spinal fluid total proteins and the value of this finding in diagnosis. He thus added another to the already known causes of increased protein in the spinal fluid.

Franklin White studied 300 cases of jaundice from the standpoint of diagnostic error and concluded that on the whole he and his Boston confreres were correct 94 times out of 100, his chief error being in those cases due to carcinoma of the liver. He felt that functional tests were useful chiefly in following the progress of the disease and in reaching a decision relative to surgery. William Stroud discussed the possible relationship between gall-bladder disease and cardiac disease, and whereas his statistical data were large he did not reach conclusions that were definitive or convincing.

Sulfapyridine in Pneumonia.

Altogether 721 cases of pneumonia treated by sulfapyridine were reported at the Atlantic City meeting of the American Association of Physicians, with the remarkably low mortality rate of from 7 to 10 per cent. Opinion on the efficacy of the new therapy was divided. Some hailed it with undisguised enthusiasm.

In Philadelphia 500 cases had been treated with it. In 100 of them no typable pneumococci could be found and the mortality was 10 per cent. In the typable 400 the mortality was 7 per cent. Type I carried the lowest mortality, Type III the highest. In forty-three instances bacteriemia was demonstrated with a mortality of 22 per cent.

From Montreal an 8.8 per cent mortality was reported in sixty-eight cases, and from New Haven two deaths (Type III) in fifty-six cases of lobar pneumonia. An initial dose of 2 gms. of sulfapyridine followed by 4 gms. every twenty-four hours for the first two or three days and by half that dose for the next two or three days was the suggested method of treatment. Intravenous administration of the sodium salt was reported upon, and the hitherto considered ideal 5 mgm. per 100 cc. concentration of the drug in the blood stream was questioned.

From Boston a note of caution was sounded in the observation that perhaps the mildness of the cases of pneumonias of last year largely explains the favorable results reported, and that the administration of so toxic an agent as sulfapyridine should be stopped as soon as possible, within forty-eight hours preferably. From New York it was countered that types of pneumonia are constant from year to year in their virulence and that variations in mortality rates are due to variations in the incidence of particular types, rather than to the change in mortality rates of particular types. A more prolonged use of sulfapyridine was suggested. The latter point of view was concurred in by those who had had an opportunity of observing this treatment in Baltimore.

One of the questions which naturally presents itself is whether or not the new drug therapy is superior to serum therapy and which should be given priority. In Montreal sulfapyridine is routinely used for the first twelve hours for pneumonia; if no improvement ensues, in suitable cases serum therapy is instituted. It should be pointed out that in the enthusiasm for sulfapyridine the great body of knowledge recently accumulated concerning the serum therapy of the disease must not be cast overboard too hastily. Both methods of treatment will undoubtedly be improved. In the present state of knowledge they should be used concurrently. One may succeed where the other fails and there is undoubted practicability in the combined employment of the two.

Department of Clinical and Medical Education
of the
Medical Society of Virginia

Internal Medicine.

ALEXANDRIA

Reports indicate that the postgraduate course offered in Alexandria during February and March was highly successful. The subjects of discussion and speakers were announced in a previous issue of the MONTHLY. The average attendance for the six meetings was twenty-four. The following doctors enrolled for the course:

Dr. Alfred Abramson
Dr. C. V. Amole
Dr. C. E. Arnette
Dr. F. I. Bloise
Dr. Perry L. Boyer
Dr. Wm. T. Burch
Dr. R. J. Cahoon
Dr. Charles Canada
Dr. Wm. P. Caton
Dr. H. G. Chissell
Dr. A. D. Daughton
Dr. M. D. Delaney
Dr. O. D. Durant
Dr. Carson Lee Fifer
Dr. J. A. Gooch
Dr. L. F. Hobbs
Dr. G. Hutto
Dr. W. H. Janney
Dr. C. E. Jenkins
Dr. C. F. Kincheloe, Jr.
Dr. Virginia Lane
Dr. H. A. Latané
Dr. J. W. Love
Dr. J. C. McCluer
Dr. W. C. McNeill
Dr. C. MacRae
Dr. J. P. Madigan
Dr. T. A. Moneymaker
Dr. A. B. Moore
Dr. S. B. Moore
Dr. L. Powell
Dr. W. L. Schafer
Dr. N. G. Schuman
Dr. J. A. Simms
Dr. W. C. West
Dr. W. B. Wilkins
Dr. W. C. Williams
Dr. H. D. Wolff, Jr.

MARTINSVILLE

The Course in Internal Medicine held at Martinsville during March and April was attended by the following doctors:

Dr. G. B. Dudley
Dr. W. B. Dudley
Dr. D. L. Fleshman
Dr. L. C. Haley
Dr. H. G. Hammond
Dr. W. G. Hardy
Dr. G. L. Jones
Dr. R. R. Lee
Dr. E. M. McDaniel
Dr. D. H. Mason
Dr. M. H. Mund
Dr. J. E. Richardson
Dr. A. W. Rucker
Dr. J. P. Scott
Dr. J. A. Shackelford
Dr. J. M. Shackelford
Dr. J. T. Shelburne
Dr. F. B. Teague
Dr. C. R. Titus
Dr. R. H. Walker

The Secretary of the Patrick-Henry Medical Society in reporting on the course states that "the course I feel was stimulating and beneficial to all those attending. I feel that the State Society is doing a very valuable piece of work in promoting these courses."

LYNCHBURG

In Lynchburg six meetings have thus far been held in the course which will extend through June 9. The attendance at each meeting has been from twenty to twenty-four doctors. A full report of this course will be made at its conclusion.

ARVONIA

At the request of the recently formed James River Medical Association a postgraduate course was begun at Arvonia on May 10. The following is the program:

WEDNESDAY, MAY 10. 8:00 P. M.
Chronic Rheumatism. Dr. Oscar Swineford, Jr., University of Virginia Medical School.
Gynecological Problems in Office Practice. Dr. Randolph H. Hoge, Medical College of Virginia.

WEDNESDAY, MAY 17. 8:00 P. M.
Gall-Bladder Disease and Its Treatment. Dr. Staige D. Blackford, University of Virginia Medcal School.
Urological Problems in Children. Dr. E. W. Kirby, University of Virginia Medical School.

WEDNESDAY, MAY 24. 8:00 P. M.
Late Toxemias of Pregnancy. Dr. Tiffany Williams, University of Virginia Medical School.
Allergic Problems of General Practice. Dr. Oscar Swineford, Jr.

WEDNESDAY, MAY 31. 8:00 P. M.
Deficiency Diseases and Their Treatment. Dr. H. B. Mulholland, University of Virginia Medical School.
Abdominal Pain in Children. Dr. W. W. Waddell, University of Virginia Medical School.

WEDNESDAY, JUNE 7. 8:00 P. M.
Headaches. Dr. John M. Meredith, University of Virginia Medical School.
Diarrhœas in Children. Dr. W. W. Waddell, University of Virginia Medical School.

St. Louis Exhibit.

A series of charts, maps and photographs describing the work of the Department of Clinical and Medical Education since its beginning was sent for exhibit at the meeting of the American Medical Association in St. Louis. Accompanying this were samples of lectures in obstetrics and pediatrics used by the postgraduate instructors and distributed to those

who attended the courses. Sample programs of past courses were included for free distribution. The Executive Secretary will be glad to have the reaction of Virginia doctors who saw the exhibit.

Medical School Clinics.

UNIVERSITY OF VIRGINIA

The twenty-third semiannual postgraduate clinic was held in the amphitheatre of the University of Virginia Medical School on Friday, May 5. The following Symposium on Vitamins constituted the program:

General Review of the Vitamins. Dr. H. B. Mulholland, University of Virginia.

Clinical Tests of Vitamin Deficiencies. Dr. H. D. Kruse, Milbank Memorial Fund, New York, N. Y.

Vitamin K in Newly-borns. Dr. W. W. Waddell, University of Virginia.

Vitamin D. Dr. L. T. Royster, University of Virginia.

Human Vitamin Requirements and Therapeutic Dosages. Dr. W. H. Sebrell, Division of Chemistry, U.S.P.H.S., Washington, D. C.

Pellagra (Illustrated with Color Moving Pictures). Dr. J. M. Ruffin, Duke University, Durham, N. C.

The program above was arranged by Dr. Staige D. Blackford, who was recently appointed Chairman of the Committee on Graduate Clinics to succeed Dr. L. T. Royster, who asked to be retired from this position which he has held since 1934.

The following doctors registered and attended the sessions:

Dr. J. B. Bailey, Keysville.
Dr. C. D. Bennett, Chatham.
Dr. P. L. Boyer, Alexandria.
Dr. O. K. Burnette, Culpeper.
Dr. Louis Butan, Abingdon.
Dr. F. L. Byers, Harrisonburg.
Dr. H. G. Byrd, Louisa.
Dr. G. C. Campbell, Staunton.
Dr. B. L. Carleton, Newport News.
Dr. W. E. Chapin, Richmond.
Dr. H. T. Chelf, Culpeper.
Dr. H. T. Chelf, Jr., Bramwell, W. Va.
Dr. Homer E. Clarke, Massie's Mill.
Dr. H. S. Daniel, Louisa.
Dr. E. D. Davis, Crozet.
Dr. C. O. Dearmont, White Post.
Dr. Frederick Delp, Pulaski.
Dr. E. B. Dovell, Unionville.
Dr. F. C. Downey, Edinburg.
Dr. Granville Eastham, Culpeper.
Dr. G. R. Elliott, Orange.
Dr. C. B. Fox, Monterey.
Dr. H. C. Hallum, Washington, D. C.
Dr. T. W. Hankins, Fordwick.
Dr. Mary Harley, Sweetbriar.
Dr. Percy Harris, Scottsville.
Dr. W. F. Hartman, Swoope.
Dr. L. C. Haynes, Mt. Jackson.
Dr. R. B. Hightower, Washington, D. C.
Dr. J. M. Holloway, Fredericksburg.
Dr. F. M. Horsley, Schuyler.
Dr. L. A. Houff, Clifton Forge.
Dr. J. F. Hubbard, Waynesboro.
Dr. J. M. Hurt, Blackstone.
Dr. Carroll Iden, Berryville.
Dr. N. B. Jeter, Covington.
Dr. C. P. Jones, Lexington.
Dr. J. Bolling Jones, Petersburg.
Dr. James King, Radford.
Dr. D. M. Kipps, Front Royal.
Dr. Anita Lotti, Charlottesville.
Dr. F. H. Lukin, Pamplin.
Dr. H. C. McCoy, Gordonsville.
Dr. John F. McGavock, Crozet.
Dr. Florence Mahoney, Staunton.
Dr. E. R. Martin, Newport News.
Dr. Ruth Mason-Grigg, Petersburg.
Dr. J. O. Mundy, Charlottesville.
Dr. J. A. Murphy, Washington, D. C.
Dr. W. I. Owens, Pulaski.
Dr. R. L. Page, Batesville.
Dr. T. E. Patteson, Ransons.
Dr. Marshall J. Payne, Staunton.
Dr. W. R. Payne, Newport News.
Dr. Charles W. Putney, Staunton.
Dr. B. F. Randolph, Arrington.
Dr. C. M. Rice, Sweetbriar.
Dr. Alex. Robertson, Staunton.
Dr. James H. Smith, Richmond.
Dr. P. S. Smith, Abingdon.
Dr. Frank Stafford, Blue Ridge Sanatorium.
Dr. Frank Tappan, Berryville.
Dr. J. F. Thaxton, Tye River.
Dr. Francis Thurman, Buena Vista.
Dr. W. E. Vermilya, Clifton Forge.
Dr. W. R. Warren, Woodberry Forest.
Dr. O. M. Weaver, State Colony.
Dr. H. F. White, Fishersville.
Dr. Leta J. White, Petersburg.
Dr. M. J. W. White, Luray.
Dr. F. J. Wright, Petersburg.
Dr. O. R. Yates, Suffolk.

MEDICAL COLLEGE OF VIRGINIA

Neuropsychiatry was the subject for the postgraduate seminar of the Medical College of Virginia, held on the morning of April 28. Discussions and demonstrations on Neurological Surgery were given in the afternoon. The program for this was published in the April issue of the MONTHLY.

Those who registered at these lectures are:

Dr. G. B. Barrow, Staunton.
Dr. W. I. Prichard, Staunton.
Dr. David Wilson, University of Virginia.

Dr. J. S. De Jarnette, Staunton.
Dr. J. L. Berkeley, Charleston, W. Va.
Dr. W. D. Hall, Raleigh, N. C.
Dr. J. F. Owen, Raleigh, N. C.
Dr. J. K. Hall, Richmond.
Dr. H. E. Jordan, University of Virginia.
Dr. H. B. Sanford, Richmond.
Dr. Roy K. Flannagan, Richmond.
Dr. M. Grove-Hagan, Richmond.
Dr. B. S. Clements, Matoaka, W. Va.
Dr. Mary Baughman, Richmond.
Dr. John B. Bullard, Richmond.
Dr. E. J. Moseley, Jr., Richmond.
Dr. M. S. Brent, Petersburg.
Dr. E. T. Terrell, Williamsburg.
Dr. L. T. Browning, Williamsburg.
Dr. J. F. Thaxton, Tye River.
Dr. L. H. Hoover, Clarksville.
Dr. and Mrs. J. B. Pettis, Staunton.
Dr. H. T. Hawkins, Waynesboro.
Dr. L. C. Liles, Raleigh, N. C.
Dr. T. M. Spessard, Norfolk.
Dr. R. L. Raiford, Franklin.
Dr. A. A. Wilson, Charleston, W. Va.
Dr. Z. A. Hurianek, Alexandria.
Dr. A. E. Turman, Richmond.
Dr. W. R. Tyson, Norfolk.

GEORGE B. ZEHMER,
Executive Secretary.

Proceedings of Societies

The Alexandria Medical Society,

At its meeting on May 11, elected Dr. Francis I. Bloise of that city as president for the coming year, and Dr. Henry A. Hornthal as vice-president. Dr. C. E. Arnette was re-elected secretary-treasurer. At this time, delegate and alternate were also elected to the State Society meeting in Richmond in October and Dr. Charles V. Amole and George M. Hutto were admitted to membership.

On May 31, the Society closed its activities until Fall with a banquet at the Lord Fairfax Country Club, at which time Dr. E. Novak, well known gynecologist of Baltimore, Md., was the guest speaker.

The Mid-Tidewater Medical Society

Met in Gloucester on April 25, with the president, Dr. J. R. Parker, of Providence Forge, presiding. The afternoon session was given over to a discussion of "Tuberculosis", with Drs. Dean Cole, Donald S. Daniel, and E. C. Harper, of Richmond, as guest speakers.

Dr. M. H. Harris, West Point, is secretary of this Society.

Richmond Academy of Medicine.

At the regular meeting of the Academy, held on May 9, Dr. Roy Donaldson McClure, Ford Hospital, Detroit, spoke on "Anoxia and What It Means to the Surgical Patient". Others on the program were Drs. William Bickers and William B. Porter, both of Richmond.

The Danville-Pittsylvania Academy of Medicine

Held its regular meeting at the Danville Golf Club on May 9. This took the form of a dinner in honor of Dr. C. W. Pritchett on the completion of fifty years of medical practice. Dr. E. H. Miller introduced Dr. Pritchett to whom he presented a silver loving cup. Dr. Pritchett then spoke on reminiscences of fifty years of medical practice.

Dr. E. E. Barksdale is President of the Academy.

S. C. HALL, JR., *Secretary.*

The Lynchburg Academy of Medicine

Held its regular meeting on May 1, with the president, Dr. S. E. Oglesby, presiding. Dr. John O. Hurt, Colony, was elected to membership. Dr. R. V. Funsten, Professor of Orthopedic Surgery, University of Virginia Hospital, presented a very instructive and practical paper on "Low Back Pain".

C. E. KEEFER, *Secretary-Treasurer.*

News Notes

Make Your Reservations for the State Medical Meeting.

The Local Committee of Arrangements for the Richmond meeting of the Medical Society of Virginia has been most active in preparing for the convention to be held here October 3, 4 and 5. Indications are that this will be a banner meeting and all members are urged to attend. Rates at the various hotels are as follows:

	One Person Single Room with Bath	Two Persons Twin Beds
John Marshall (Headquarters)	$3.50 to $5.00	$6.00 to $10.00
Jefferson	$3.00 to $6.00	$6.00 to $8.00
Richmond	$2.50 to $4.00	$4.50 to $7.00
Murphy's	$2.50 to $3.50	$4.00 to $6.00
Capitol	$2.00 to $2.50	$3.50 to $4.00

Any assistance will be gladly given by Dr. Wm. H. Higgins, Chairman of Hotels, 710-12 Medical Arts Bldg., Richmond.

Guest Speakers for the Annual Meeting.

In response to the demand of some of the members that there be a larger number of out-of-State speakers at the annual meetings of the Medical Society of Virginia, the Program Committee arranged for three this year, and the president, Dr. Alex. F. Robertson, has had acceptances from the following: Dr. Franklin M. Hanger, Jr., a native of Staunton and now associate professor of medicine at Columbia University in New York City; Dr. Mont R. Reid, a native of Fincastle and now professor of surgery at the University of Cincinnati; and Dr. Louis Hamman of Baltimore, who is also well known to Virginia doctors. The privilege of hearing these speakers will be an added attraction of this meeting.

American Medical Association.

At the annual meeting of the Association, held in St. Louis, May 15-19, Dr. Rock Sleyster, Wauwatosa, Wis., succeeded to the presidency, and Dr. Nathan B. Van Etten, New York, was named president-elect. Dr. Alphonse McMahon, St. Louis, was elected vice-president, and the following officers were re-elected: Dr. Olin West, Chicago, secretary and general manager; Dr. Herman L. Kretschmer, Chicago, treasurer; Dr. H. H. Shoulders, Nashville, speaker of the house of Delegates; and Dr. R. W. Fouts, Omaha, vice-speaker.

The 1940 meeting will be held in New York City, the 1941 meeting in Cleveland, and Atlantic City was chosen for the 1942 convention.

The Virginia Society of Ophthalmology and Oto-Laryngology

Held its annual meeting in Roanoke, May 6, with the president, Dr. C. T. St. Clair, of Bluefield, W. Va., presiding. There was an attendance of approximately seventy-five. Speakers on the program were: Dr. Daniel B. Kirby, New York; Dr. Edward A. Looper, Baltimore; Dr. E. T. Gatewood, Richmond; Dr. H. Grant Preston, Harrisonburg; Dr. F. H. McGovern, Danville; and Drs. H. S. Hedges and F. D. Woodward, Charlottesville.

Dr. Karl S. Blackwell, Richmond, was elected president; Dr. G. G. Hankins, Newport News, vice-president; and Dr. Mortimer H. Williams, Roanoke, re-elected secretary-treasurer. Members of the executive committee are Dr. St. Clair, the retiring president, Dr. M. H. Hood, Portsmouth, and Dr. E. W. Burton, Charlottesville.

The 1940 meeting will be held in Newport News in May.

The Virginia Pediatric Society

Held its annual clinical meeting at the University of Virginia on May 6, with an attendance of twenty-two members and several visitors. The following program was presented by University doctors: Effect of Vitamin K Concentrate on Prothrombin Time and Clotting Time in the Newly-Born with Special Reference to Unnatural Bleeding in the Newly-Born by Dr. DuPont Guerry, III; Erythroblastic Anemia of Cooley with A Case Report by Dr. McLemore Birdsong; Pseudo-Hemophilia with A Case Report by Dr. Lawrence T. Royster; and A Case of Aplastic Anemia with Recovery by Dr. A. S. Hurt. All papers were freely discussed. Luncheon at Farmington Country Club followed the scientific program.

Dr. W. W. Waddell, Jr., University, is President, and Dr. J. M. Bishop, Roanoke, Secretary-Treasurer.

Medical College of Virginia News.

Commencement exercises closing the one hundred

first session of the college will be held June 6. It is expected that 160 will be graduated at these exercises: sixty-four in medicine; thirty-one in dentistry; twenty-five in pharmacy; thirty-one in nursing, and two for the master of science degree. Dr. Otis W. Caldwell, General Secretary of the American Association for the Advancement of Science, will give the Commencement address.

The annual sermon will be preached at Monumental Church by Reverend George Ossman, the rector.

Monday, June 5, will be Alumni Day, and many alumni are expected for the various functions scheduled for that day.

Dr. Walter E. Vest of Huntington, West Virginia, will be given the honorary degree of Doctor of Science at the Commencement exercises.

Thirty-one medical graduates are expected to receive commissions as first lieutenants in the Medical Corps of the United States Army.

Dr. Harvey B. Haag, professor of pharmacology, Dr. Frank L. Apperly, professor of pathology, Dr. Ernst Fischer, associate professor of physiology and pharmacology; Dr. J. C. Forbes, associate professor of biochemistry, Dr. Rolland J. Main, Associate professor of physiology, and Dr. C. R. Spealman, instructor in physiology and pharmacology, attended the annual meeting of the Federation of Experimental Biology, which includes the societies of physiology, biological chemistry, pharmacology and pathology, at Toronto, April 26-29. Drs. Fischer, Spealman and Main gave papers during the sessions.

The John and Mary R. Markle Foundation of New York has made a grant of $3,000.00 for studies in liver poisoning in the department of biochemistry. The Dazian Foundation for Medical Research has also made a grant of $700.00 for research in preventive medicine. The college has received in bequests, gifts, and grants for the current session $2,-023,024.00.

Dr. Harry Bear, dean of the school of dentistry, has been elected president of the American Association of Dental Schools.

Mr. Wortley F. Rudd, dean of the school of pharmacy, was recently made president-elect of the Virginia Academy of Science.

Dean Harry Bear of the school of dentistry and Dean Wortley F. Rudd of the school of pharmacy attended the meetings of the American Council on Education in Washington last week. Dean Bear was the official delegate from the American Association of Dental Schools and Dean Rudd from the American Association of Colleges of Pharmacy.

At the annual meeting of the Virginia Academy of Science in Danville, the first part of May, three papers were presented by members of the college faculty. Dr. J. C. Forbes, associate professor of biochemistry and Mr. E. L. Outhouse, assistant in chemistry, gave a paper on "Studies on the Mechanism of the Protective Action of Xanthine". Dr. Forbes and Mr. R. V. Bowers, a graduate student in chemistry, also presented a paper on "A Study of Enzymatic Hydrolysis". Mr. Robert F. McCrackan, associate professor of biochemistry, gave a paper on "A Three-in-One Type of Pipet".

News from University of Virginia, Department of Medicine.

Drs. C. C. Speidel and J. E. Kindred attended the meetings of the American Association of Anatomists in Boston from April 6 to 8. Dr. Speidel read a paper on The Adjustments of Cutaneous Nerve Endings During Growth, and Dr. Kindred read a paper on A Quantitative Study of the Histology of the Secondary Lymphoid Nodules of the Submaxillary Lymphoid Nodes of Twenty-Day Old Albino Rats.

On April 11, Dr. Tiffany J. Williams addressed the Danville Academy of Medicine on the subject of Hypertension Subsequent to Toxemias of Pregnancy.

Dr. Henry H. Faxon, of Boston, visited the Medical School on April 12.

Dr. Staige D. Blackford spoke before the Patrick Henry Postgraduate Clinic held in Martinsville on April 14. His subject was Gall-bladder Disease and Its Treatment.

Dr. Anderson Hilding, of Duluth, Minnesota, visited the Medical School on April 18.

At the meeting of the University of Virginia Medical Society on April 24, Dr. John M. Blackford, of Seattle, spoke on Peptic Ulcer.

The American Philosophical Society has awarded a grant of $400.00 to Dr. C. C. Speidel in aid of his cinephotomicrographic studies of living tissues.

Dr. George M. Lawson was elected President of the University of Virginia Medical Society for the coming year and Dr. Andrew D. Hart was elected Secretary.

On April 28, Dr. H. B. Mulholland addressed a Postgraduate Clinic in Lynchburg, under the auspices of the Division of Extension of the University of Virginia. He spoke on Diseases of the Thyroid, Parathyroid and Suprarenal Glands. On May 3, he spoke on Acidosis, Alkylosis and Dehydration, and on May 19 on Carbohydrate Metabolism.

Drs. H. S. Hedges and F. D. Woodward attended the meeting of the Virginia Society of Otolaryngologists and Ophthalmologists on May 6. Dr. Hedges presented a paper on The Treatment of Epithelioma at the Limbus of the Eye and Dr. Woodward showed motion pictures illustrating the surgical procedure of laryngectomy.

Dr. D. C. Wilson attended the meetings of the American Psychiatric Association in Chicago from May 8 to 11. He read a paper on The Results of Shock Therapy in the Treatment of Affective Disorders.

The School of Nursing held its commencement exercises in Cabell Hall on the afternoon of May 24.

Dr. Harvey E. Jordan, professor of histology and embryology, was awarded the President and Visitors' Research Prize at the annual meeting of the Virginia Chapter of Sigma Xi, held the latter part of May.

New York Polyclinic Medical School and Hospital News.

Dr. Walter C. Alvarez, Mayo Clinic, Rochester, Minn., read a paper on "The patient who doesn't get well in spite of much treatment" on Thursday, May 4.

The New York Polyclinic Medical School and Hospital is inaugurating a combined full time course in Urology, covering an academic year (8 months), on October 1, 1939. It will comprise instruction in pharmacology; physiology; embryology; biochemistry; bacteriology and pathology; practical work in surgical anatomy and urological operative procedures on the cadaver; regional and general anesthesia (cadaver); office gynecology; proctological diagnosis; the use of the ophthalmoscope; physical diagnosis; roentgenological interpretation; electrocardiographic interpretation; dermatology and syphilology; neurology; physical therapy; continuous instruction in cysto-endoscopic diagnosis and operative instrumental manipulation; operative surgical clinics; demonstrations in the operative instrumental management of bladder tumors and other vesical lesions as well as endoscopic prostatic resection.

News from Duke University Medical School.

Physicians and medical scientists appeared prominently on the program of the Duke University centennial celebration which closed recently. Throughout the year a series of symposia were held on the campus. In the symposium on medical problems two themes were stressed: "The Future of American Medicine," and "Diseases of Special Interest to Physicians in the Southern States."

Among the speakers were: Dr. A. W. Freeman, of Johns Hopkins University School of Medicine; Dr. George W. McCoy, of Louisiana State University School of Medicine; Dr. John Punnett Peters, of the Yale Medical School; Dr. Morris Fishbein, editor of the Journal of the American Medical Association; Dr. George H. Whipple, dean of the University of Rochester School of Medicine; Dr. William H. Sebrell, surgeon in the U. S. Public Health Service; Dr. Charles F. Craig, of Tulane University School of Medicine; Dr. R. W. A. Ochsner, also of Tulane; Dr. William G. MacCallum, of Johns Hopkins; Dr. Arthuro Lorenzo Carrion, of San Juan, P. R.; Dr. A. M. Snell, of the Mayo Foundation, and others.

Chief Surgeon, C. & O. Railway.

Dr. J. M. Emmett, Clifton Forge, who has been serving as assistant to Dr. W. T. Oppenhimer, chief surgeon of the Chesapeake and Ohio Railway, for some time, has been named chief surgeon and Dr. Oppenhimer has been named advisory chief surgeon. Dr. Emmett will also continue in charge of the hospital at Clifton Forge.

Dr. J. P. McNeil,

Formerly located at Dante, has located at Kingsport, Tenn., where he will limit his practice to diagnosis and internal medicine with special reference to cardiology. After leaving Dante, he took a year's work in internal medicine at the University of Pennsylvania Postgraduate School of Medicine and then studied cardiovascular diseases under Dr. Samuel A. Levine and Dr. Paul D. White, both of Boston.

Dr. Peple Honored.

The Authorities of St. Luke's Hospital, Richmond, with which Dr. W. Lowndes Peple has been associated since his graduation in 1897, honored him on the evening of May 16, by presenting his portrait to the Staff of McGuire Clinic. Dr. Stuart McGuire presided at the exercises which were held at the Richmond Academy of Medicine Building and followed by a social hour. Other speakers were Dr. Leigh Buckner of Roanoke, first interne at St. Luke's Hospital, Dr. J. Bolling Jones of Petersburg, Dr. R. L. Payne of Norfolk, and Dr. Hugh H. Trout of Roanoke. Dr. John Bell Williams, business manager of the Hospital, presented the portrait which which was accepted by Dr. James H. Smith. These talks were followed by a short speech of appreciation by Dr. Peple.

Lederle at the New York World's Fair.

In the Medicine and Public Health Building, New York World's Fair, Lederle Laboratories are sponsoring the scientific exhibits on Allergy and on Pneumonia, each exhibit being controlled by a committee of eminent specialists on these diseases.

The Pneumonia exhibit presents, pictorially, the best composite opinion of the medical profession on how a pneumonia case should be treated.

The second exhibit, on Allergy, tells, in changing dramatic sequences, three two-minute dramas of Allergy. By means of an animated question box and dioramas showing typical scenes in the doctor's office, a search for the offending allergic excitant in each of the three stories is conducted through information obtained by questions, scratch tests and an examination of the patient's family tree. An interesting part of the allergy exhibit is an illuminated transparency chart showing in full color, forty-eight of the most common allergic excitants.

Physicians visiting the New York World's Fair are entitled to exclusive privileges in the Professional Club in the same building. Admission is obtained by simple identification as a doctor, without charge, and is only available to physicians and their guests. Provision is made here for consultation with exhibit sponsors on technical questions.

Dr. John H. Hopkins,

Who has been studying at the New York Polyclinic Hospital for the past year has re-opened his offices in Lynchburg, at 1112 Church Street, and will limit his practice to Urology.

Ex-Internes of the Medical College of Virginia

Held their annual meeting at the College on April 27, at which time the following officers were elected: Dr. W. P. Barnes, president; Dr. Henry Spalding, vice-president; and Dr. Nathan Bloom, secretary-treasurer. All are from Richmond.

Virginia Academy of Science.

At the annual meeting of the Academy held in Danville, May 4-6, Dr. Ruskin Freer, Lynchburg, succeeded to the presidency, and Dr. W. F. Rudd, Richmond, was named president-elect. Dr. E. C. L. Miller, Richmond, continues as secretary-treasurer. The next meeting will be held in Lynchburg, May, 1940.

Dr. Joseph E. Barrett,

Former director of the Michigan State Hospital Commission, has been appointed clinical director of the Southwestern State Hospital at Marion, effective June 1. This is the second appointment of a clinical director in the Virginia State Hospitals, Dr. J. B. Pettis having been named for the Western State Hospital in March. In addition to Dr. Barrett's duties at Marion, he is to begin a survey of the entire field of extramural services, such as outpatient service and local mental hygiene clinics.

Governor, West Virginia Section, American College of Physicians.

Announcement is made that Dr. Albert H. Hoge of Bluefield has been appointed governor of the West Virginia Section, American College of Physicians, succeeding Dr. Walter E. Vest of Huntington, resigned. Both of these doctors have many friends in Virginia having graduated from medical colleges in this State.

Married.

Dr. William Edgar Waddell, of the class of '34, University of Virginia Medical School, and Miss Joan Thompson of St. Johns, Newfoundland, recently. Dr. Waddell has for the past two years been serving as resident surgeon on the staff of the Notre Dame Bay Memorial Hospital at Twillingate, Newfoundland. They expect to be in the States this summer and will be at Dr. Waddell's former home in Lexington, early in July.

The Neuropsychiatric Society of Virginia,

At its last meeting held in February, elected the following officers for the ensuing year: President,

Dr. Hugh C. Henry of Richmond; vice-president, Dr. Thos. N. Spessard of Norfolk; and secretary-treasurer, Dr. Edward H. Williams of Richmond. This organization has a membership of forty and meets three times a year. The next meeting will be on June 14, at 2:00 p.m. at the Cavalier Hotel, Virginia Beach. Neurological Clinics will be held by Dr. Frank H. Redwood and Dr. Thos. N. Spessard of Norfolk, and the following papers will be presented: Some Observations on Psychoanalytic Theory and Practice by invited guest, Dr. Lawrence F. Woolley, director of Sheppard and Enoch Pratt Hospital, Towson, Maryland; The Concept of Psychopathic Personality by Dr. Joseph R. Blalock of Marion; and Is Mental Disease on the Increase by Dr. O. B. Darden of Richmond. The scientific meeting will be followed by a smoker and dinner.

Dr. Carrington Williams,

Richmond, has been elected to membership in the American Surgical Association, which limits its membership to 175 surgeons throughout the United States and Canada.

Dr. Harry F. White,

Class of '08, former University College of Medicine, Richmond, has been promoted from Senior Surgeon to Medical Director in the U. S. Public Health Service.

The North Carolina Medical Society

Held its annual meeting, May 9-14, as a convention cruise to Bermuda, on board the *S. S. Queen of Bermuda*. Dr. William Allan, Charlotte, was installed as president and the following officers elected: president-elect, Dr. Hubert B. Haywood, Raleigh; vice-presidents, Dr. F. Webb Griffith, Asheville, and Dr. Frank C. Smith, Charlotte. Dr. T. W. M. Long, Roanoke Rapids, is secretary-treasurer.

The Virginia, Maryland and District of Columbia Medical Society

Held its Spring meeting in Alexandria, May 17, with the president, Dr. M. B. Hiden, Warrenton, presiding. The following officers were elected: president, Dr. S. A. Nichols, Clarksville, Md.; vice-president, Dr. J. E. Knight, Warrenton, Va.; and Drs. J. Rogers Young, A Magruder MacDonald, and Robert S. Lamb, all of Washington, re-elected as recording secretary, corresponding secretary, and treasurer, respectively.

New Books.

The following are recent acquisitions to the Library of the Medical College of Virginia and are available to our readers, the only cost being return postage:

Aaron, H. Our common ailment.
Abbott, M. E. Classified and annotated bibliography of Sir William Osler's publications.
Alcohol: Its action on the human organism.
Alexander, J. The collapse therapy of pulmonary tuberculosis.
Baggs, T. A. Where does America go from here?
Balme, H. Relief of Pain.
Bealle, M. A. Medical Mussolini.
Bean, R. B. The peopling of Virginia.
Belding & Marston. A textbook of medical bacteriology.
Brickel, A. C. J. Surgical treatment of hand and forearm.
Chambers, H. D. Yaws.
Cowdry, E. V. Problems of ageing.
Davis, A. A. Dysmenorrhoea.
Donnison, C. P. Civilization and disease.
Ford, F. R. Diseases of the nervous system in infancy, childhood and adolescence.
Forkner, C. E. Leukemia and allied disorders.
Garbedian, H. G. Albert Einstein; maker of universes.
Gorham & Ivy. General function of the gall-bladder from the evolutionary standpoint.
Gutheil, E. The language of a dream.
Hancock, G. C. A report on the occurrence of glass fragments in foods packed in glass containers.
Henderson & Gillespie. Textbook of psychiatry for students and practitioners.
Jerger, J. A. Doctor, here's your hat.
Kahn, R. L. Tissue immunity.
Kline, B. S. Microscopic slide precipitation tests for the diagnosis and exclusion of syphilis.
Levine, M. Practical otology.
Lewis, T. Research in medicine, and other addresses.
Little, C. C. Civilization against cancer.
McClendon, J. F. Iodine and the incidence of goiter.
McDowall, R. J. S. The control of the circulation of the blood.
Mayo, E. The human problems of an industrial civilization.
Med. Res. Council. Report on radium beam therapy research.
Med. Res. Council. Medical uses of radium.
Miller, R. H. Applied anatomy, functional and typographical.
Monier-Williams, G. W. Lead in food.
Morrison, F. B. Feeds and feeding.
Pearl, R. The natural history of population.
Peter, L. C. The extra-ocular muscles.
Propst, D. W. The patient is the unit of practice.
Robert, J. C. The tobacco kingdom.
Robey, W. H. Health at fifty.
Schilder, P. Psychotherapy.
Schleich, K. L. Those were good days.
Smith & Gault. Essentials of pathology.

Spurling, R. G. Practical neurological diagnosis.
Stone, E. L. The new-born infant.
Swift, E. H. A system of chemical analysis (qualitative and semi-quantitative) for the common elements.
Waln, N. Reaching for the stars.
White, J. C. The autonomic nervous system.
Wilbur, R. L. The march of medicine.
Yearbook of surgery. 1938.
Yearbook of obstetrics. 1938.
Yearbook of medicine. 1938.
Zinsser, H. *et al.* Immunity; principles and application in medicine and public health.

Dr. George A. Stover,

South Boston, received several broken ribs and cuts, the latter part of March, when a front tire blew out, throwing him from his car. He has recovered sufficiently to resume his work though his car was almost a total wreck.

Medical Care—Program of Welfare Council.

Dr. F. P. Fletcher, representative from the Medical Society of Virginia to the Virginia Welfare Council, advises that the Council will hold its annual program in connection with the Institute of Public Affairs at the University of Virginia on July 11. At this time, medical care in its broad aspects will be discussed. The Committee in charge of this program is composed of Dr. Belle Boone Beard, chairman, Mr. Thomas C. Boushall, Dr. Basil B. Jones, Dr. F. P. Fletcher, Dr. E. L. Fox, Dr. W. H. Stauffer, and Miss Claire McCarthy. Further information may be obtained upon inquiry to the Virginia Welfare Council, 803½ East Main Street, Richmond.

Physicians as Artists.

Mead Johnson and Company of Evansville, Indiana, has published a booklet, "Parergon", dealing with physicians as artists, in which occurs the following quotations:

"From time immemorial, medicine and art have been closely associated. The same skill that makes the surgeon's fingers deft with scalpel and ligature is at work in the beautiful examples of sculpture and carving shown in this book."

"* * * every physician is able to develop a sensitiveness to and an appreciation for fine art. He can also cultivate a hobby which if not one of the fine arts, is in the class of 'work by the side of work.' Dr. Charles A. Dana, who has always stressed the value of cultural medicine, has advised: 'Be a collector, for example, of stamps or automobiles, or old books, or neckties or pins; or find diversion in some collateral branch of science; the lore of birds, of fishing and shooting. Make a garden or cultivate shrubs and flowers. These kinds of activities will make your life happier and your professional character more attractive and effective.' "

A free copy of "Parergon" is available to any of our readers upon request sent the publishers.

Dr. Warren T. Vaughan,

Richmond, was elected President of the American Society for the Study of Allergy, at its recent meeting in St. Louis. He succeeds Dr. Harry L. Alexander of St. Louis.

American Life Convention.

The twenty-ninth annual meeting of the Medical Section of the American Life Convention will be held at The Homestead, Hot Springs, June 27-29. The program will include papers by outstanding men in the field of medicine, both from Canada and the United States. Dr. Ennion S. Williams, Medical Director of the Life Insurance Company of Virginia, Richmond, is scheduled to discuss a paper on Non-Venereal Disease of Genito-Urinary System to be presented by Dr. Joe Travenick of Nashville, Tenn.

Dr. A. L. Jones,

Formerly of Splashdam, has opened offices in Chilhowie where he will continue his practice.

Dr. Wright Clarkson,

Petersburg, attended the quarterly meeting of the Association for the Study of Neoplastic Diseases, held in Detroit in April. He is this year's president, and Dr. Rollin Stevens of Detroit, chairman for the meeting, is vice-president. A large number of surgeons, pathologists, radiologists and biochemists from all over America attended the meeting.

Dr. John T. R. Sweeney,

Richmond, was recently elected president of the Highland Park Citizens' Association for the coming year.

Dr. C. J. Andrews,

Norfolk, addressed the Brunswick County Women's Field Army of the American Society for the Control of Cancer at a meeting in Lawrenceville early in May.

The American Public Health Association

Has recently adopted five reports dealing with Educational Qualifications of Public Health Statistics, School Health Educators, Public Health En-

gineers, Sanitarians, and Sub-Professional Field Personnel in Sanitation. These reports are distributed free of charge in the hope that they will serve a useful purpose in raising the educational standards of professional public health personnel. Copies may be secured from the Book Service, American Public Health Association, 50 West 50th St., New York City.

Dr. H. J. Williams,

Class of '38, Medical College of Virginia, who has been interning at St. Luke's Hospital, Richmond, located at Brownsburg, June 1, for the general practice of medicine.

Pan-Pacific Surgical Association.

The Third Congress of the Pan-Pacific Surgical Association is to be held in Honolulu, September 15 to 28, 1939. An invitation is extended to all surgeons to meet with outstanding men from countries of the Pacific area, including Australia, New Zealand, China, Japan, Java, Canada, and the United States, for an interchange of surgical thought and for the purpose of bringing about better understanding through personal contact among the surgeons of these countries.

Dr. F. J. Pinkerton, Young Building, Honolulu, Hawaii, is secretary-treasurer of the Association.

American Board of Internal Medicine, Inc.

Written examinations for certification by the American Board of Internal Medicine will be held in various sections of the United States on the third Monday in October and the third Monday in February.

Formal application must be received by the Secretary before August 20, 1939, for the October 16, 1939, examination, and on or before January 1 for the February 19, 1940, examination.

Application forms may be obtained from Dr. William S. Middleton, Secretary-Treasurer, 1301 University Avenue, Madison, Wisconsin.

American Congress of Physical Therapy.

The eighteenth annual scientific and clinical session of the Congress will be held September 5-8, at the Hotel Pennsylvania, New York City. Preceding these sessions, the Congress will conduct an intensive instruction seminar in physical therapy for physicians and technicians—August 30 to September 2. The clinics which comprise half of the schedule make this course outstanding for its practical value, and, as in the past, outstanding clinicians and teachers will participate. Registration is limited to 100 and is by application only. For information concerning seminar and preliminary program of convention proper, address American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago.

300 X-ray Examinations per Hour.

H. Holfelder and F. Berner, in a recent issue of *Münchener medizinische Wochenschrift,* reported a new method of X-raying the chests of large groups cheaply and quickly which has been developed in Germany. It consists of photographing the fluoroscopic image on motion picture film. When developed, the strip of film is projected on a screen for interpretation. By this method two physicians, assisted by a crew of ten men, examined at the rate of 300 per hour, more than 10,000 men during a Nazi party celebration at Nüremberg. The device is not a substitute for the standard X-ray technique but is a means of "screening" and it promises the possibility of examining the whole nation.

Home for Convalescences.

A home for the care and treatment of chronic aged and convalescences has been opened at Arrington, Nelson County, Virginia, under the direction of Dr. and Mrs. Fred M. Horsley. Information upon request. (*Adv.*)

Wanted—

A young married physician, temperate, industrious, American, for general town and rural practice, to associate with and succeed older physician contemplating retirement. Give particulars. Address "Location", care this JOURNAL. (*Adv.*)

Work for Summer Wanted.

Young doctor, single, wishes general practice or contract work from July 1 to August 15. Graduate of McGill University with three years' hospital work. Address "Summer Work", care of the VIRGINIA MEDICAL MONTHLY. (*Adv.*)

Obituary Record

Dr. Pitt Edward Tucker,

Well-known physician at Buckingham for the past thirty-three years, died on April 28, after a short illness, though he had been in poor health for several

years. He was sixty-eight years of age and a graduate of the Medical College of Virginia in 1897. He was a member of the Medical Society of Virginia, of the staff of the Southside Hospital in Farmville, a trustee of State Teachers College in Radford, a Mason, and a member of the Buckingham County Ruritan Club. He served overseas with the rank of captain in Base Hospital No. 59, during the World War. His wife, a sister and three brothers survive him.

Dr. Millard Percy Doyle,

Prominent Norfolk physician, died May 8, following a heart attack. He was a native of Dinwiddie County and fifty-eight years of age. Dr. Doyle graduated from the Medical College of Virginia in 1907, following which he located in Norfolk. He had been active in civic affairs, having served as president of the Rotary Club, and president of the Florence Crittenden Training Home. He was also a Mason, a Shriner, and a Knight Templar. He had been a member of the Medical Society of Virginia since 1910. Wis wife and two sons survive him.

Dr. Jeffrey Neese Elder,

Hopewell, died May 11, following a long illness. He was a native of North Carolina and forty-nine years of age. Dr. Elder graduated from the Medical College of Virginia in 1913 and located for practice in Hopewell in 1915. He served overseas during the World War and upon his return was commissioned Captain. Dr. Elder resumed his practice but had to retire in 1928 because of illness resulting from being gassed during the War. He was first commander of the Hopewell American Legion, a charter member and one of the first officers of the Kiwanis Club, and had been a member of the Medical Society of Virginia since 1914. His wife and a daughter survive him. One of his brothers is Dr. D. L. Elder of Hopewell.

Testimonial to James Carroll Flippin, M.D., Sc.D., Dean, 1924-1939.

The Faculty of the Department of Medicine of the University of Virginia record their profound loss in the death on February 16, 1939, of there Dean and Professor of Internal Medicine, Dr. James Carroll Flippin.

Dr. Flippin was born in Lunenburg County, Va., on January 20, 1878. Following the completion of his preliminary education, he entered the University of Virginia and In 1901 received the degree of Doctor of Medicine. After a year of internship he returned to his Alma Mater and was for the remaining thirty-six years of his life continuously connected with the Medical Department. In a teaching capacity, he served successively as Demonstrator of Histology, Medical Biology, and Pathology; Adjunct Professor of Bacteriology; Adjunct, Associate, and Professor of Clinical Medicine, and Professor and head of the Department of Internal Medicine. He discharged in addition the duties of University Physician and director of the diagnostic laboratories from 1906 to 1915, and after 1924 those of Dean of the Medical Department.

During the later years of his life, Dr. Flippin was actively interested in organized medicine and held many positions of honor and responsibility, including that of president of the Medical Society of Virginia and delegate from that body to the American Medical Association, in which he was, during recent years, a member of the Council on Scientific Assembly. In both of these as well as in various local organizations he was an influential member and an active participant throughout his professional career. The Medical College of Virginia, in 1938, conferred on him the honorary degree of Doctor of Science as a testimonial to his achievements and to the cordial relations which had been fostered between the two medical schools of the State.

The Medical Department of the University of Virginia, during Dr. Flippin's tenure as Dean, made its greatest and most dramatic advances: the enrollment of students was increased to meet the growing demands for medical education; the faculty was enlarged to provide for a more diversified curriculum; the clinical staff was augmented to meet the calls of an ever-growing clientele; new buildings with teaching and research laboratories were constructed, and the facilities of the Hospital and Out-Patient Clinics were greatly expanded.

Dr. Flippin was a man of genial and kindly personality. He was tolerant of the views of others but he was firm in his official acts. His judgment was excellent; his advice was eagerly sought. As a physician he exemplified the highest traditions of the profession. Through long training in the fundamental sciences he laid a foundation for his career as teacher and practitioner and he was enabled thereby to advance diagnosis and therapy. In both, he achieved eminence; to both he brought the idealism of thoroughness and the richness of experience. He will be remembered by his fellow physicians for his skill in diagnosis and prognosis; by his patients for his kindly bedside manner and his inspiration of encouragement and hope; by his students for his profound sympathy with youth, his fairness in administering discipline, and his loyalty to his profession. In his death organized medicine has lost an interested and active member, medical education a judicious leader, and this Faculty a sincere friend.

It is resolved that this testimonial be spread on the minutes of the Faculty of the Department of Medicine of the University of Virginia, that it be published in the VIRGINIA MEDICAL MONTHLY, and that a copy be sent to the family.

L. T. ROYSTER
J. A. WADDELL
H. B. MULHOLLAND
Committee.

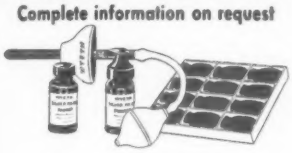
A CONVENIENT OFFICE TREATMENT FOR TRICHOMONAS VAGINITIS

SILVER PICRATE
Wyeth

THIS simple treatment requires but two office visits, a week apart, for insufflations and the nightly insertion of a Silver Picrate suppository for twelve nights.

Complete remission of symptoms and removal of the trichomonad from the vaginal smear usually is effected following the Silver Picrate treatment for trichomonas vaginitis.

Complete information on request



JOHN WYETH & BROTHER, INCORPORATED, Philadelphia, Pa.

McGUIRE CLINIC

ST. LUKE'S HOSPITAL

RICHMOND, - - - - - - - - - VIRGINIA

. . . MEDICAL AND SURGICAL STAFF . . .

General Medicine:
JAMES H. SMITH, M. D.
HUNTER H. McGUIRE, M. D.
MARGARET NOLTING, M. D.
JOHN P. LYNCH, M. D.

Pathology and Radiology:
J. H. SCHERER, M. D.

Obstetrics:
H. HUDNALL WARE, JR., M. D.
H. C. SPALDING, M. D.

General Surgery:
STUART McGUIRE, M. D.
W. LOWNDES PEPLE, M. D.
W. P. BARNES, M. D.
J. H. REED, M. D.

Roentgenology:
J. L. TABB, M. D.
C. D. SMITH, M. D.

Urology:
AUSTIN I. DODSON, M. D.
CHAS. M. NELSON, M. D.

Orthopedic Surgery:
WILLIAM T. GRAHAM, M. D.
D. M. FAULKNER, M. D.
J. T. TUCKER, M. D.

Dental Surgery:
JOHN BELL WILLIAMS, D. D. S.
GUY R. HARRISON, D. D. S.

Eye, Ear, Nose and Throat:
F. H. LEE, M. D.

JEFFERSON HOSPITAL AND TRAINING SCHOOL FOR NURSES

ROANOKE, VIRGINIA

A Fully Equipped General Hospital for the Care of Medical and Surgical Cases

No Drug Habitues, Contagious or Mental Cases received

For further information address JAS. A. ARMSTRONG, Superintendent.

THE TUCKER SANATORIUM, *Incorporated*

212 West Franklin Street (Corner of Madison) RICHMOND, VIRGINIA

Private Sanatorium for neurological cases under the charge of Drs. Beverley R. Tucker, Howard R. Masters and James Asa Shield. Departments of Physiotherapy.

MEDICAL COLLEGE *of* VIRGINIA

HOSPITAL DIVISION

RICHMOND, VIRGINIA

◆

Private Rooms:

Private single rooms and rooms for two, three and four patients in the private pavilion are provided at reasonable rates.

Public Wards:

Generous accommodations for treatment of patients in the public wards are available. An ample staff of physicians and surgeons in the various fields is appointed to serve these patients.

MEMORIAL HOSPITAL
DOOLEY HOSPITAL
SAINT PHILIP HOSPITAL
OUTPATIENT DEPARTMENT

◆

LEWIS E. JARRETT, M. D., *Superintendent.*

JOHNSTON-WILLIS HOSPITAL

RICHMOND, ◆ VIRGINIA

A MODERN GENERAL HOSPITAL
PRIVATELY MANAGED
SITUATED IN THE QUIET OF THE
WEST END RESIDENTIAL SECTION

IT HAS STOOD THE TEST

THE one urge that transcends all others in the physician's mind when he prescribes a feeding formula for a baby is to obtain the best physical development of which the child is capable.

We are continually receiving very gratifying reports from physicians who prescribe Lactogen in their infant feeding cases. Furthermore, extensive tests of Lactogen feeding on large groups of infants under supervision of competent pediatricians have proved to their satisfaction that Lactogen is very successful as a routine infant food as well as for the supplemental feeding of the newborn.

If you have not as yet tried Lactogen, we urge you to do so.

No laity advertising. No feeding directions given except to physicians.

For free samples of Lactogen and literature, mail your professional blank to Lactogen Dept.

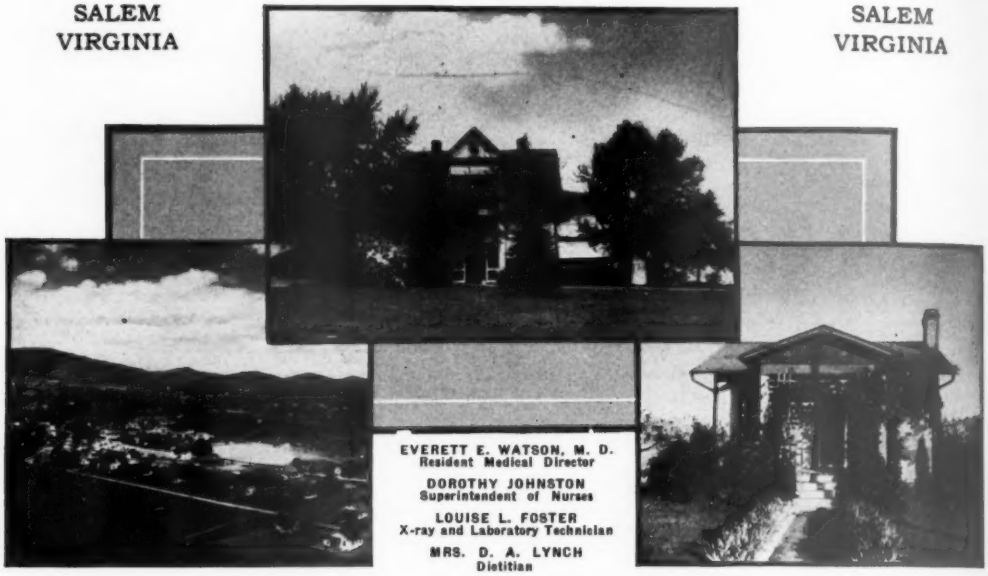
NESTLÉ'S MILK PRODUCTS, Inc.

155 East 44th Street . . . New York, N. Y.

MOUNT REGIS SANATORIUM

SALEM
VIRGINIA

SALEM
VIRGINIA



EVERETT E. WATSON, M. D.
Resident Medical Director

DOROTHY JOHNSTON
Superintendent of Nurses

LOUISE L. FOSTER
X-ray and Laboratory Technician

MRS. D. A. LYNCH
Dietitian

MODERATE RATES. WRITE FOR INFORMATION

A modern, well equipped, private sanatorium, beautifully located between the Allegheny and Blue Ridge Mountains of Virginia. Offers treatment for tuberculosis and other chronic diseases of the chest.

Caters to convalescents or anyone desiring a rest in the mountains under ideal hygienic and climatic conditions. Physician and nurses in constant attendance. Private and semi-private cottages.

ST. ELIZABETH'S HOSPITAL

RICHMOND, VIRGINIA

STAFF

J. SHELTON HORSLEY, M. D.---Surgery and Gynecology
JOHN S. HORSLEY, JR., M. D.---Plastic and General Surgery
GUY W. HORSLEY, M. D.---Proctology and General Surgery
DOUGLAS G. CHAPMAN, M. D.---Internal Medicine
WM. H. HIGGINS, M. D.---Consultant in Internal Medicine
AUSTIN I. DODSON, M. D.---Urology
FRED M. HODGES, M. D.---Roentgenology
L. O. SNEAD, M. D.---Roentgenology
R. A. BERGER, M. D.---Roentgenology
HOWELL F. SHANNON, D. M. D.---Dental Surgery
HELEN LORRAINE---Medical Illustration
N. E. PATE---Administration

ASSISTANT ATTENDING STAFF

HARRY J. WARTHEN, JR., M. D.---Surgery
W. K. DIX, M. D.---Internal Medicine
J. P. BAKER, JR., M. D.---Internal Medicine
MARSHALL P. GORDON, JR., M. D.---Urology
CHAS. M. NELSON, M. D.---Urology

The Operating Rooms and all the Front Bedrooms are now completely Air-Conditioned

SCHOOL FOR NURSES

The Training School is affiliated with **Johns Hopkins Hospital** in Baltimore for a three months' course, each, in Pediatrics and Obstetrics. All applicants must be graduates of a high school or have the equivalent education. Address: DIRECTOR OF NURSING EDUCATION.

In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.

THE VEIL MATERNITY HOSPITAL

MIDDLETOWN, DELAWARE

Strictly Private.

Absolutely Ethical.

Patients accepted at any time during gestation.

Open to Regular Practitioners.

Early entrance advisable.

For Care and Protection of the
BETTER CLASS OF UNMARRIED YOUNG WOMEN.

Adoption of babies when arranged for. Rates reasonable. Located on the Delaware Division of Penna. R. R., twenty-five miles south of Wilmington, Delaware.

Write for Booklet.

THE VEIL
Box 204
Middletown, Delaware

THE THOMPSON HOMESTEAD SCHOOL

For the shy, nervous, retarded or unsocial child. Nursery Department. Year round private home on 150-acre farm near Charlottesville. Enrollment limited. Booklet.

MRS. J. BASCOM THOMPSON, *Principal*
Free Union, Virginia

The NIGHTINGALE *NURSING HOME*

209 West Franklin St., Richmond, Virginia

A Home for the Care and Treatment of Chronic and Convalescent Cases.

Very reasonable rates available.

J. ARTHUR GALLANT, M. D., *Director.*
Telephone 2-6893

Gill Memorial Eye, Ear and Throat Hospital, Inc.

ROANOKE, VIRGINIA

STAFF

DR. ELBYRNE G. GILL
DR. JOHN E. ALEXANDER
Residents
DR. KEITH E. GERCHOW
DR. MAX L. HOLLAND

GEORGE P. STONE, B.S.
Laboratory and X-ray Technician

ELEANOR ROZAR, B.S.
Research Technician

AUDREY WAGNER, R. N.
Superintendent

A Modern, Fireproof Hospital, Specialty Designed and Equipped for the Medical and Surgical Care of Ophthalmology, Oto-laryngology, Facio-Maxillary Surgery, Bronchoscopy and Esophagoscopy.

Complete Laboratory and X-Ray Equipment.

Physicians and Graduate Nurses in Constant Attendance.

The Hospital offers a residentship of two years to a graduate of an approved medical school, who has had an internship of at least one year in an approved hospital.

For further information, address

Gill Memorial Eye, Ear and Throat Hospital, Inc.

711 South Jefferson Street, ROANOKE, VIRGINIA

STUART CIRCLE HOSPITAL

RICHMOND, VIRGINIA

Medicine:
ALEXANDER G. BROWN, JR., M. D.
OSBORNE O. ASHWORTH, M. D.
MANFRED CALL, III, M. D.
M. MORRIS PINCKNEY, M. D.
ALEXANDER G. BROWN, III, M. D.

Obstetrics:
GREER BAUGHMAN, M. D.
BEN H. GRAY, M. D.
WM. DURWOOD SUGGS, M. D.

Ophthalmology, Otolaryngology:
CLIFTON M. MILLER, M. D.
R. H. WRIGHT, M. D.
W. L. MASON, M. D.

Pediatrics:
ALGIE S. HURT, M. D.
CHAS. PRESTON MANGUM, M. D.

Physiotherapy:
ELSA LANGE, B. S., Technician
MARGARET CORBIN, B. S., Technician

Surgery:
CHARLES R. ROBINS, M. D.
STUART N. MICHAUX, M. D.
ROBERT C. BRYAN, M. D.
A. STEPHENS GRAHAM, M. D.
CHARLES R. ROBINS, JR., M. D.

Urological Surgery:
JOSEPH F. GEISINGER, M. D.

Oral Surgery:
GUY R. HARRISON, D. D. S.

Pathology:
REGENA BECK, M. D.

Roentgenology and Radiology:
FRED M. HODGES, M. D.
L. O. SNEAD, M. D.
R. A. BERGER, M. D.

Medical Illustrator:
DOROTHY BOOTH

Stuart Circle Hospital has been operated twenty-four years, affording scientific care to patients in General Medicine, Surgery, Obstetrics and the various medical and surgical specialties. Detailed information furnished physicians.

CHARLOTTE PFEIFFER, R. N., *Superintendent.*

SAINT ALBANS SANATORIUM

RADFORD, VIRGINIA

A private institution for the diagnosis and treatment of nervous and mental disease, alcoholism and drug addiction. Rates reasonable.

J. C. KING, M. D. FRANK A. STRICKLER, M. D. JAMES KING, M. D.

WESTBROOK SANATORIUM

Richmond, TELEPHONE, DIAL 5-3245 **Virginia**

Main Building, South View.

Cedar Lodge.

STAFF

Department for Men

J. K. HALL, M. D.
O. B. DARDEN, M. D.
E. H. ALDERMAN, M. D.

Department for Women

P. V. ANDERSON, M. D.
E. H. WILLIAMS, M. D.
REX BLANKINSHIP, M. D.

The scope of the work of the sanatorium is limited to the diagnosis and treatment of the various types of nervous and mental disorders and to the addictions to drugs and to alcohol.

The medical staff devotes its attention entirely to the patients in the sanatorium.

The institution maintains a school for trained attendants in which instruction in the care of the nervous and mental is emphasized.

There are twelve separate buildings for patients with 150 beds. Satisfactory and congenial grouping of patients is thereby made easy.

The grounds are extensive, the institution owns a considerable acreage, and it is consequently able to control its immediate neighborhood.

Rooms may be had single or en suite. There are a few small cottages designed for the use of individual patients.

A comprehensive examination is made of each patient. The hydrotherapy equipment is complete. A teacher gives practical daily instruction to small groups in the arts and crafts. Helpful occupation in the out-of-doors for the men patients is afforded by the truck farm, dairy, and in the poultry yards.

There are bowling, tennis, croquet, pool, and a weekly movie and dance. Special information and rates are available for physicians.

In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.

COPYRIGHT 1939, THE COCA-COLA COMPANY

Every Virginia Doctor Should Have This Book!

The history of medicine in the Old Commonwealth from Jamestown to the beginning of the present century, is a work every doctor should be proud to own. It is complete and intensely interesting.

Medicine In Virginia
By Dr. Wyndham B. Blanton
3 volumes, $21

Special to members of the Medical Society of Virginia
The 3 Volumes for $14

To get this price, order through

The Medical Society of Virginia
Richmond, Virginia

REVISED REPRINT PRICES

Size page 5x7 Type size 3x5
Minimum order 100

	100	250	500	1,000	2,000
4 pp	$ 3.10	$ 3.50	$ 4.20	$ 5.10	$ 7.15
8 "	5.60	6.40	7.00	9.00	12.40
12 "	8.25	9.45	10.80	13.50	19.90
16 "	8.55	10.15	11.65	14.90	21.25
20 "	10.50	12.50	14.20	17.40	26.00
24 "	11.15	13.55	15.25	20.10	27.75
32 "	14.70	17.90	20.85	29.25	39.60
Extra for Covers	3.50	4.00	5.50	6.60	9.90
Printed Envelopes to fit	3.25	4.75	5.50	7.00	11.75

Williams Printing Co.
11 North Fourteenth Street
RICHMOND, VIRGINIA

ADRENALIN

A supply of Adrenalin Ampoules—at your office or in your bag—may be vitally needed in an emergency. How about your own supply? Is it adequate?

Adrenalin is the Parke-Davis brand of Epinephrine, U. S. P. Adrenalin Chloride Solution 1:1000, in 1-cc. ampoules, boxes of 12, 25, and 100, also in 1-ounce bottles, is available in drug stores everywhere.

PARKE, DAVIS & COMPANY • *Detroit*

The World's Largest Makers of Pharmaceutical and Biological Products

Component and Other Medical Societies in Virginia

(Officers and Others are Requested to Notify the Monthly of Changes)

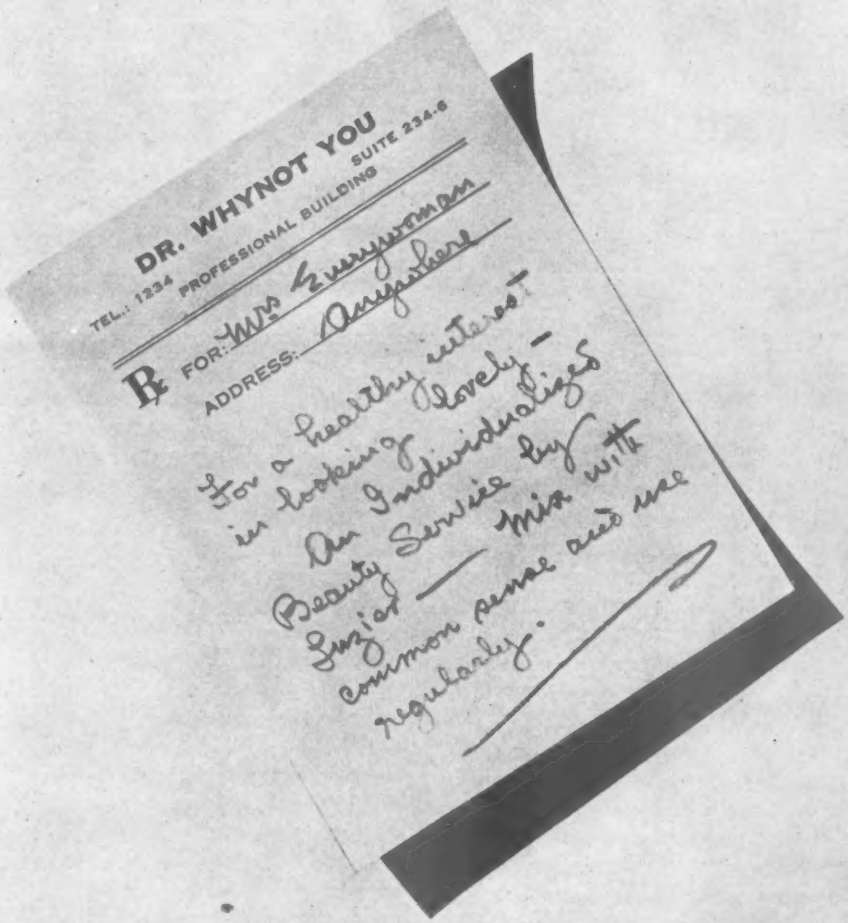
SOCIETY	PRESIDENT	SECRETARY	TIME OF MEETING
Accomac County	O. R. Fletcher, Sanford	J. F. Edmonds, Accomac	Quarterly.
Albemarle County	F. D. Daniel, Charlottesville	Wm. H. Wood, Jr., Charlottesville	Monthly.
Alexandria City	F. I. Bloise, Alexandria	C. E. Arnette, Alexandria	Monthly.
Alleghany-Bath Counties	R. A. Warren, Hot Springs	R. P. Hawkins, Clifton Forge	Bi-Monthly.
Amelia County	J. M. Habel, Jetersville	J. L. Hamner Mannboro	
Arlington County	Alfred M. Palmer, Arlington	H. L. Bastien, Arlington	January, April, July, August.
Augusta County	W. M. Phelps, Staunton	A. F. Robertson, Jr., Staunton	February, May, August, November.
Bedford County	M. P. Rucker, Bedford	W. V. Rucker, Bedford	Quarterly.
Botetourt County	S. F. Driver, Troutville	L. A. Micou, Eagle Rock	
Charlotte County	C. M. Nicholson, Charlotte C. H.	R. B. Cralle, Drakes Branch	
Clinch Valley Med. Society	E. P. Cox, Norton	C. B. Bowyer, Stonega	Spring and Fall.
Culpeper County	J. L. Stringfellow, Culpeper	O. K. Burnette, Culpeper	
Danville-Pittsylvania	E. E. Barksdale, Danville	S. C. Hall, Danville	
Dickenson-Buchanan Counties	W. A. Carr, Harman	T. C. Sutherland, Haysi	
Elizabeth City County	W. P. Smith, Hampton	R. H. Wright, Phoebus	
Fairfax County	R. E. Feagans, Fairfax	Alice Keissling, Falls Church	February, May, August, November.
Fauquier County	W. O. Bailey, Leesburg	W. R. Pretlow, Warrenton	Monthly.
Floyd County	S. T. Yeatts, Floyd	F. C. Bedsaul, Floyd	
Fourth District Med. Society	C. V. Montgomery, South Hill	C. E. Martin, Emporia	5 times a year.
Fredericksburg Med. Assn.	J. M. Holloway, Fredericksburg	T. B. Payne, Fredericksburg	Monthly.
Halifax County	D. C. Steelsmith, South Boston	W. C. Brann, South Boston	
Hanover County	Hawes Campbell, Jr., Hanover	F. L. Hughes, Ashland	Bi-Monthly.
Isle of Wight County	Rea Parker, Smithfield		
James River Med. Society	J. H. Yeatman, Fork Union	E. J. Haden, Ore Bank	Quarterly.
Lee County	B. C. Grigsby, St. Charles	J. B. Muncy, Pennington Gap	
Loudoun County	G. H. Musgrave, Leesburg	F. T. Hauser, Purcellville	Monthly.
Louisa County	H. S. Daniel, Louisa	H. G. Byrd, Louisa	
Lynchburg Academy	S. E. Oglesby, Lynchburg	C. E. Keefer, Lynchburg	Monthly.
Mecklenburg County	H. H. Braxton, Chase City	W. W. Wilkinson, LaCrosse	
Med. Assn. Valley of Virginia	Fred'k Gochnauer, Upperville	H. W. Miller, Woodstock	September.
Med. Soc. Northern Virginia	O. W. Carper, Front Royal	J. E. Harris, Winchester	
Medical Society of Virginia	A. F. Robertson, Jr., Staunton	Agnes V. Edwards, Richmond	Richmond, Fall 1939.
Mid-Tidewater Med. Society	J. R. Parker, Providence Forge	M. H. Harris, West Point	January, April, July, October.
Nansemond County	E. C. Joyner, Suffolk	T. E. Scarlett, Suffolk	
Nelson County	B. F. Randolph, Arrington	J. F. Thaxton, Tye River	
Norfolk County	W. B. Newcomb, Norfolk	L. B. Scott, Norfolk	Weekly.
Northampton County	W. J. Sturgis, Nassawadox	W. C. Henderson, Nassawadox	Quarterly.
Northern Neck	C. Y. Griffith, Machodoc	Lee S. Liggan, Irvington	Spring and Fall.
Orange County	E. B. Dovell, Unionville	G. R. Elliott, Orange	
Patrick-Henry Counties	J. A. Shackelford, Martinsville	R. H. Walker, Martinsville	January, April, July, October.
Piedmont Med. Society	O. N. Shelton, Orange	H. S. Daniel, Louisa	
Princess Anne County	H. F. Dormire, Va. Beach	W. L. Taylor, Va. Beach	
Richmond Academy	Karl S. Blackwell, Richmond	Mary Martha Nokely, Richmond	2nd and 4th Tuesdays.
Roanoke Academy	W. W. S. Butler, Roanoke	A. C. Davis, Roanoke	1st and 3rd Mondays.
Rockbridge County	F. L. Thurman, Buena Vista	E. P. Tompkins, Lexington	
Rockingham County	B. S. Yancey, Harrisonburg	P. S. Hill, Harrisonburg	Monthly.
Russell County	T. G. Smith, Lebanon, R. D.	W. C. Elliott, Lebanon, R. D.	
Scott County	C. R. Fugate, Clinchport	J. M. Dougherty, Jr., Gate City	
Seaboard Med. Assn.	Julian L. Rawls, Norfolk	C. P. Jones, Newport News	December 12-14, 1939, Virginia Beach, Va.
Southampton County	Jack Grizzard, Branchville	W. T. McLemore, Courtland	April and September.
South Piedmont Med. Society	A. P. Bohannon, Virgilina	J. A. Owen, Turbeville	Spring and Fall.
Southside Va. Med. Assn.	C. S. Dodd, Petersburg	R. L. Raiford, Franklin	March, June, September, December.
Southwestern Virginia	H. W. Bachman, Bristol	James King, Radford	March and September.
Tazewell County	J. W. Shawver, Tazewell	Isaac Peirce, Tazewell	
Tri-State Med. Assn. Va. & N. C.	J. F. Highsmith, Fayetteville, N. C.	J. M. Northington, Charlotte, N. C.	Charleston, S. C., February, 1939.
Va. Neuropsychiatric Society	H. C. Henry, Richmond	E. H. Williams, Richmond	
Va. Orthopedic Society	K. M. Hoover, Roanoke	B. H. Kyle, Lynchburg	Richmond, Fall 1939.
Va. Pediatric Society	W. W. Waddill, Charlottesville	J. M. Bishop, Roanoke	Richmond, Fall 1939.
Va. Peninsula Academy of Med.	H. G. Longaker, Newport News	E. B. Mewborne, Newport News	3rd Mondays.
Va. Roentgen Ray Club	F. M. Hodges, Richmond	V. W. Archer, Charlottesville	Richmond, Fall 1939.
Va. Society of Obst. & Gyn.	C. J. Andrews, Norfolk	R. B. Nicholls, Norfolk	Richmond, Fall 1939.
Va. Society of O. L. & O.	Karl Blackwell, Richmond	M. H. Williams, Roanoke	Newport News, May, 1940.
Va. Urological Society	L. T. Price, Richmond	L. D. Keyser, Roanoke	Richmond, Fall 1939.
Warwick County	E. B. Mewborne, Newport News	Orvin C. Jones, Newport News	Monthly.
Williamsburg-James City	E. B. Kilby, Toano	I. S. Zfass, Williamsburg	
Wise County	G. B. Bowers, Stonega	C. L. Harshbarger, Norton	Bi-Monthly.

In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.

SERVICE

Luzier's

☆ ☆ ☆ *Common Sense Prescribes* ☆ ☆ ☆


DR. WHYNOT YOU
TEL.: 1234 PROFESSIONAL BUILDING SUITE 234-6
℞ FOR: Wm Everysomman
ADDRESS: Anywhere
For a healthy interest in looking lovely — An Individualized Beauty Service by Luzier — plus with common sense used regularly.

LUZIER'S, INC., MAKERS OF FINE COSMETICS

KANSAS CITY, MO.

Miller & Rhoads announces

the opening of a new department devoted exclusively to

CAMP

Scientific Supports

In the seclusion of this new section, one may select—with the aid of our Camp-trained fitters—Camp surgical supports of any type, from garments for general wear to prescription corsetry.

Authorized Camp Service—Second Floor

Miller & Rhoads

Richmond, Virginia

To Complete the Picture

Enjoy

WHOLESOME, REFRESHING

Chewing Gum

Doctors welcome for themselves and for those whose health they guard, the outdoor life and relaxation of the summertime...And the healthful enjoyment of Chewing Gum has its part, too. Most everybody enjoys the delicious taste and refreshment of Chewing Gum. So don't overlook this, doctor, when you say "relax, ease-up and enjoy yourself!"

Four Factors which help lead to Good Teeth are: (1) Proper Food, (2) Personal Care, (3) Seeing Your Doctor and Dentist regularly and (4) Plenty of Chewing Exercise.

The National Association of Chewing Gum Manufacturers, Staten Island, New York

T-137

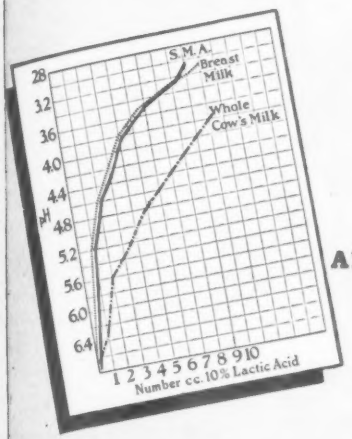
Why

S.M.A. FED INFANTS SHOW EXCELLENT NUTRITIONAL RESULTS

NOT ONLY IS THE ANALYSIS LIKE BREAST MILK

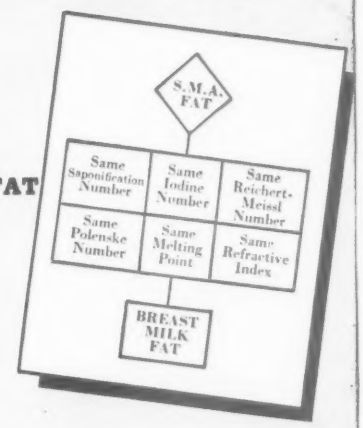
COMPARATIVE ANALYSIS OF S.M.A. AND BREAST MILK

Chemical and Physical Analysis	S.M.A.	Breast Milk
Fat	3.5-3.6%	3.59
Protein	1.3-1.4%	1.23-1.5
Carbohydrate	7.3-7.5%	7.57
Ash	0.25-0.30%	0.215-0.226
pH	6.8-7.0	6.97
Δ	0.56-0.61	0.56
Electrical Conductivity	0.0022-0.0024	0.0023
Specific Gravity	1.032	1.032
Caloric Value: —per 100 c. c.	68.0	68.0
—per ounce	20.0	20.0



AND THE BUFFER LIKE BREAST MILK . . . .

BUT FAT OF S.M.A. IS LIKE BREAST MILK FAT



In Addition **S.M.A. is an antirachitic and antispasmophilic food—has a Vitamin A, B, and D content in each feeding that is *constant every month of the year.* It is usually unnecessary to feed any vitamin supplements other than orange juice.**

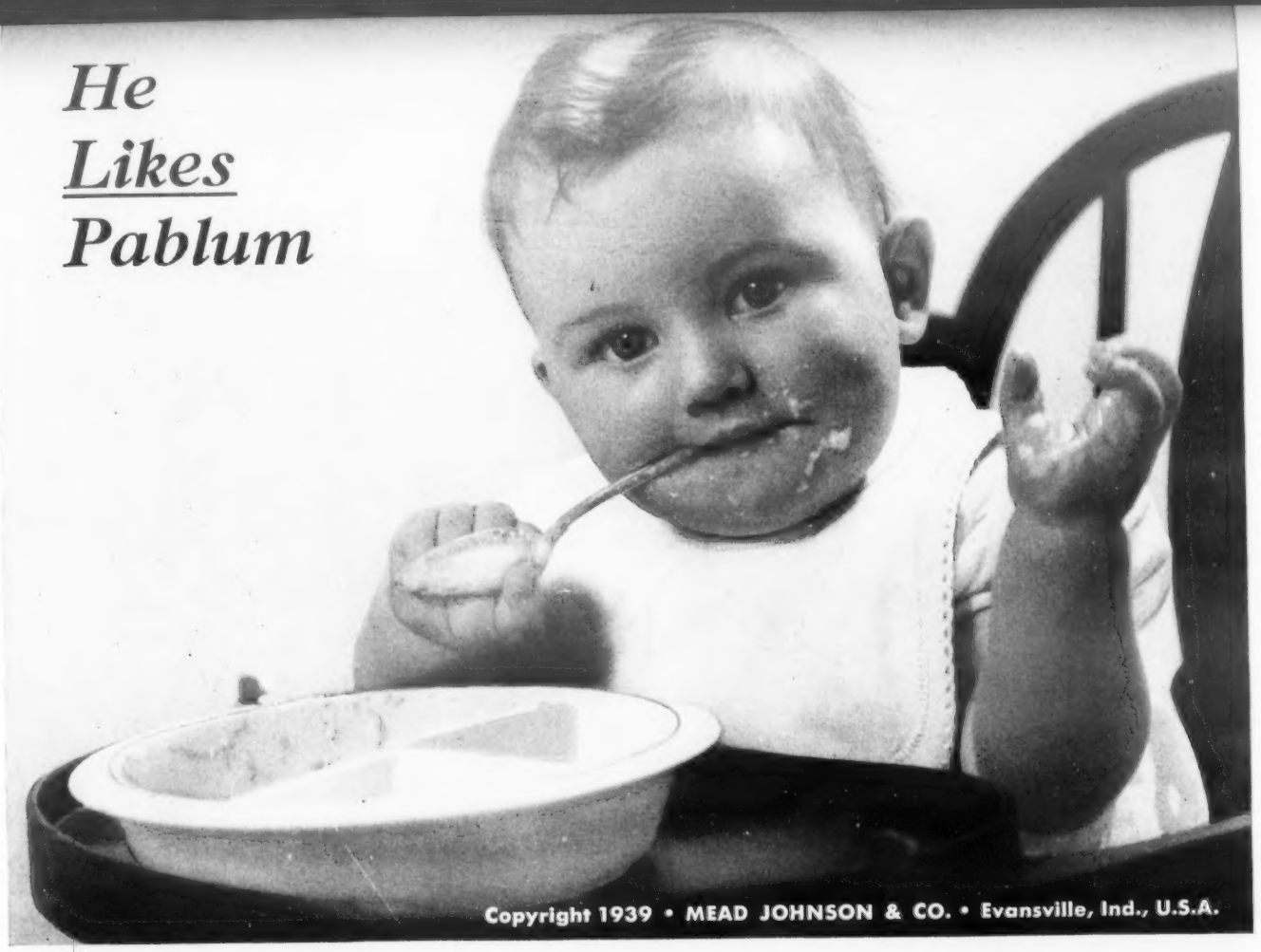
S.M.A. is a food for infants—derived from tuberculin tested cows' milk, the fat of which is replaced by animal and vegetable fats including biologically tested cod liver oil; with the addition of milk sugar and potassium chloride, altogether forming an antirachitic food. When diluted according to directions, it is ESSENTIALLY SIMILAR TO HUMAN MILK *in percentages of protein, fat, carbohydrate and ash, in chemical constants of the fat and in physical properties.*

SAMPLES FREE TO PHYSICIANS
(Please use Professional Stationery)

S.M.A. CORPORATION • 8100 McCORMICK BOULEVARD • CHICAGO, ILLINOIS

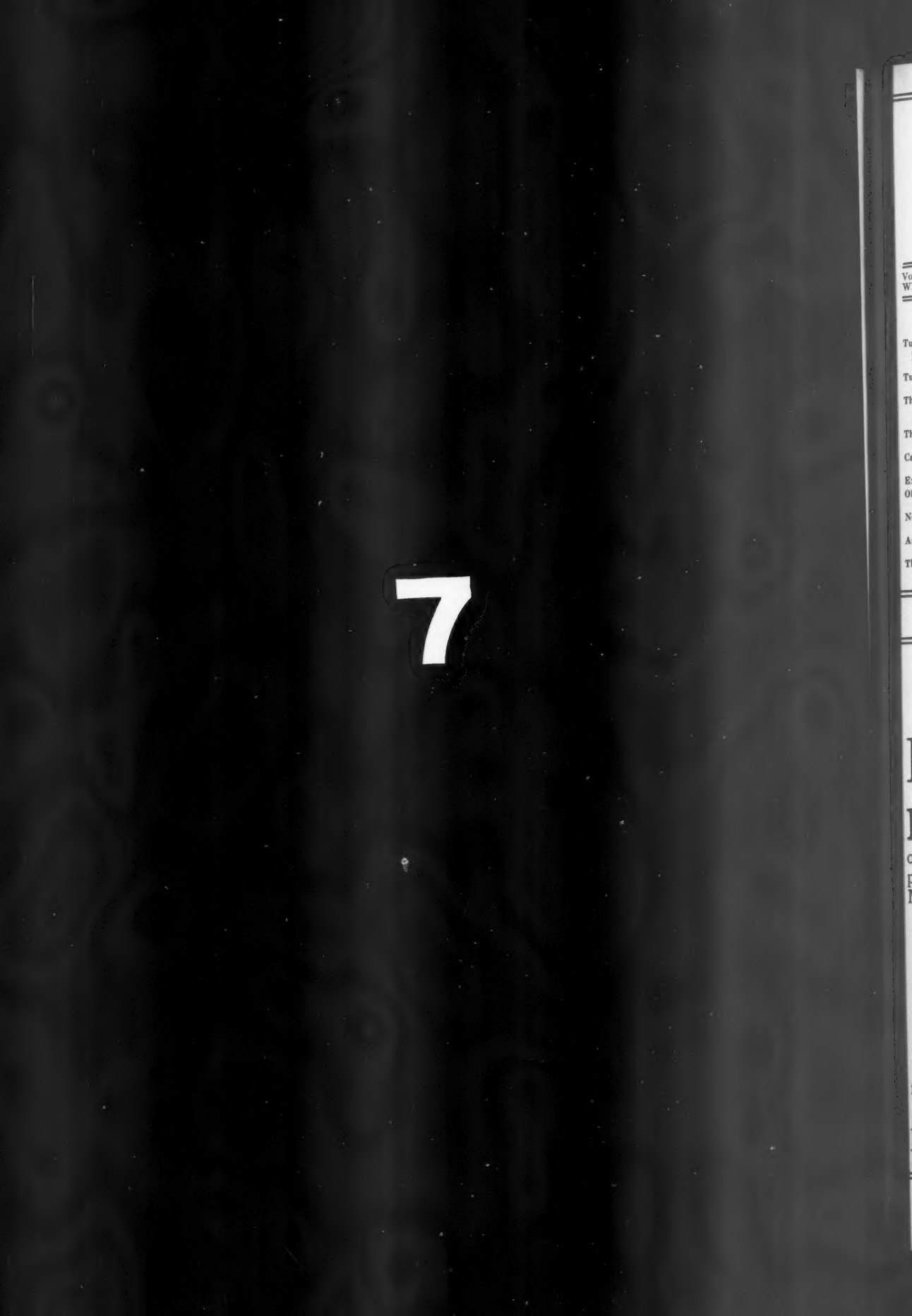
In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.

He
Likes
Pablum



Copyright 1939 • MEAD JOHNSON & CO. • Evansville, Ind., U.S.A.

In writing advertisers, please mention VIRGINIA MEDICAL MONTHLY.


7